Vol. 1047 Number 3

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

October 16, 1984

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Apr. 13, 1984. *Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Oct. 13, 1981 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	4,775 through 4,777
Utility Patents	4,293,957 through 4,295,226

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f))	$ 200.00
By other than a small entity	$ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f))	$ 50.00
By other than a small entity	$ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,307,053, Re. S.N. 499,968, Filed June 1, 1983, Cl. 264/165, METHOD AND APPARATUS FOR PROCESSING COMPRESSIBLE MATERIAL, John W. Daws, et al., Owner of Record: *Owens-Corning Fiberglas Corp., Toledo, Ohio,* Attorney or Agent: Ronald G. Hudgens, Ex. Gp.: 147

4,312,357, Re. S.N. 573,614, Filed Jan. 24, 1984, Cl. 128/664, TRANSILLUMINATION DIAGNOSITC METHOD AND APPARATUS, Torsten Andersson, et al., Owner of Record: *Sinus Medical Equipment AB, Stockholm, Sweden,* Attorney or Agent: William L. Mathis, et al., Ex. Gp.: 335

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not re-

ceived, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,364,463, Reexam. No. 90/000,624, Requested: Sept. 12, 1984, Cl. 333/191, MONOLITHIC PIEZOELECTRIC FILTER HAVING MASS LOADED ELECTRODES FOR RESONATION REGIONS ACOUSTICALLY COUPLED TOGETHER, William D. Beaver, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: Seymour E. Hollander, Ex. Gp.: 252, Requester: AT & T Bell Laboratories, Murray Hill, N.J.

3,511,282, Reexam. No. 90/000,618, Requested: Sept. 4, 1984, Cl. 138/113, PRESTRESSED CONDUIT FOR HEATED FLUIDS, Glen Paul Willhite, et al., Owner of Record: *Requester,* Attorney or Agent: Gerald L. Floyd, Ex. Gp.: 243, Requester: Conoco, Inc., Ponca City, Okla.

3,780,842, Reexam. No. 90/000,631, Requested: Sept. 17, 1984, Cl. 192/0.096, SINGLE CLUTCH AND THROTTLE LEVER COMBINED WITH A THROTTLE WARM UP LEVER, Roger B. Whipple, et al., Owner of Record: *Outboard Marine Corp., Waukegan, Ill.,* Attorney or Agent: Robert E. Clemency, Ex. Gp.: 350, Requester: Owner

3,984,299, Reexam. No. 90/000,626, Requested: Sept. 13, 1984, Cl. 204/188R, PROCESS FOR ELECTRODEPOSITING CATIONIC COMPOSITIONS, Robert D. Jerabek, Owner of Record: *PPG Industries, Inc., Pittsburgh, Pa.,* Attorney or Agent: Russell A. Eberly, Ex. Gp.: 112, Requester: PPG Industries, Inc., Pittsburgh, Pa.

4,027,043, Reexam. No. 90/000,611, Requested: Aug. 22, 1984, Cl. 426/69, SOLID ANIMAL FEED SUPPLEMENT, Jack J. Schroeder, Owner of Record: *Jack Schroeder, Rolling Hills, Calif.,* Attorney or Agent: Robert E. Strauss, Ex. Gp.: 130, Requester: Donald G. Leavitt, St. Louis, Mo.

4,171,340, Reexam. No. 90/000,630, Requested: Sept. 17, 1984, Cl. 422/036, FUMIGATING APPARATUS AND METHOD, Akira Nishimura, et al., Owner of Record: *Earth Chemical Co., Ltd., Hyogo, Japan,* Attorney or Agent: Armstrong, Nikaido, et al., Ex. Gp.: 134, Requester: Earth Chemical Co., Washington, D.C.

4,347,360, Reexam. No. 90/000,625, Requested: Sept. 12, 1984, Cl. 544/276, RING OPEN NUCLEOSIDE ANALOGUES, Kelvin K. Ogilvie, Owner of Record: *Ens Bio Logicals, Inc., Toronto, Canada,* Attorney or Agent: Fleit, Jacobson, et al., Ex. Gp.: 120, Requester: Howard J. Schaeffer, Raleigh, N.C.

4,396,449, Reexam. No. 90/000,622, Requested: Sept. 10, 1984, Cl. 156/251, CUTTING AND SEALING PROCESS FOR THERMOPLASTIC MATERIALS, Dennis R. Tumminia, Owner of Record: *Dow Chemical Co., Midland, Mich.,* Attorney or Agent: Richard G. Waterman, Ex. Gp.: 138, Requester: Dow Chemical Co., Chicago, Ill.

4,401,624, Reexam. No. 90/000,627, Requested: Sept. 13, 1984, Cl. 422/12, BUFFERED SOLUTIONS WHICH HAVE A REDUCED CORROSIVE NATURE, Charles B. Atwater, Owner of Record: *Syntex (USA), Inc., Palo Alto, Calif.,* Attorney or Agent: Joseph I. Hirsch, Ex. Gp.: 130, Requester: Brooks, Haidt, et al., New York, N.Y.

4,411,262, Reexam. No. 90/000,614, Requested: Aug. 23, 1984, Cl. 128/90, CONSTRUCTIONAL MATERIAL, Wulf von Bonin, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, West Germany,* Attorney or Agent: Lawrence S. Pope, Ex. Gp.: 336, Requester: Bayer Aktiengesellschaft, Pittsburgh, Pa.

4,420,568, Reexam. No. 90/000,617, Requested: Aug. 24, 1984, Cl. 436/536, FLUORESCENT POLARIZATION IMMUNOASSAY UTILIZING SUBSTITUTED TRIAZINYLAMINOFLUORECENTS, Chao-Huei Wang, Owner of Record: *Abbott Laboratories, Chicago, Ill.,* Attorney or Agent: Keith V. Rockey, Ex. Gp.: 120, Requester: Owner

4,445,402, Reexam. No. 90/000,616, Requested: Aug. 31, 1984, Cl. 81/57.16, POWER TONG AND BACK-UP TONG ASSEMBLY, Garth M. Farr, et al., Owner of Record: *Farr Oil Tool, Inc., Houston, Tex.,* Attorney or Agent: Arnold, White & Durkee, Ex. Gp.: 323, Requester: Eckel Manufacturing Co., Inc., Odessa, Tex.

COMMISSIONER ORDERED REEXAMINATIONS

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the Orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed. 37 CFR 1.248(a)(5) and 1.525(b).

4,403,653, Reexam. No. 90/000,621, Ordered: Sept. 19, 1984, Cl. 165/170, HEAT TRANSFER ELEMENTS, Maxwell W. Davidson, Owner of Record: *United Wire GRP PLC, Edinburgh, Scotland,* Attorney or Agent: Nathiel Humphries, Ex. Gp.: 340, Requester: Commissioner Ordered

4,424,786, Reexam. No. 90/000,619, Ordered: Sept. 19, 1984, Cl. 123/538, FUEL SAVING DEVICE, Jean C. Imbert, Owner of Record: *Jean C. Imbert, Amphoux France,* Attorney or Agent: Samuel Scrivener, Ex. Gp.: 340, Requester: Commissioner Ordered

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Trademark Manual of Examining Procedure Revision

The Patent and Trademark Office announces publication of Revision 6 of the Trademark Manual of Examining Procedure. It is a complete edition. Distribution to current subscribers began Sept. 10, 1984. The manual may be ordered, on a subscription basis, from:

Mr. Michael DiMario
Assistant Public Printer
The Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20401

The cost is $24.00. Charges may be made to deposit accounts if the requestor is an account holder in good standing at the time the request is received. The deposit account number should be included with the order. Checks or money orders should be made payable to the Commissioner of Patents and Tradmarks.

MARGARET M. LAURENCE
Sept. 13, 1984. *Assistant Commissioner for Trademarks.*

Erratum

"All reference to Patent No. 4,380,968 to Arthur B. Renny of Mich., for 'ART OF EXHIBITING FISH' appearing in the Official Gazette of Apr. 26, 1983, should be deleted since the patent actually issued earlier on Mar. 4, 1980."

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on

selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Federal Patent Licensing
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Office of Federal Patent Licensing
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-429,913 (4,464,862). CHEMICAL APPLICATOR.
SN 6-573,748. METHOD AND APPARATUS FOR TRANSPORTING IMPLEMENTS.
SN 6-625,272. HIDE TRANSFER APPARATUS AND METHOD.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-329,870 (4,465,769). NON-TRANSFORMED THYMIDINE KINASELESS CELL LINE AND ITS USE FOR TESTING TUMORIGENIC POTENTIAL OF GENES.
SN 6-585,111. SYNTHESIS OF PLATINUM (IV) ANTINEOPLASTIC AGENT.
SN 6-601,314. CARBAMATES OF COLCHICINE AND THIOCOLCHICINE SUITABLE FOR TREATMENT OF GOUT AND MURINE MALIGNANCIES.
SN 6-604,136. SUBSTITUTED N-METHYL DERIVATIVES OF MITINDOMIDE.
SN 6-607,160. THERAPY FOR RETINOID PATHOGENESIS.
SN 6-618,949. RAPID VISUALIZATION SYSTEM FOR GEL ELECTROPHORESIS.
SN 6-619,325. METHOD AND DEVICE FOR QUANTITATIVE ENDPOINT DETERMINATION IN MICROFLUOROPHOTOMETRY.

DEPARTMENT OF THE AIR FORCE

SN 6-370,234. RANGE-ONLY MULTISTATIC RADAR SYSTEM.
SN 6-601,515. RETRO DIRECTIVE RADAR TARGET SIMULATOR BEACON APPARATUS AND METHOD.
SN 6-603,528. PORTABLE, SEQUENTIAL AIR SAMPLER.
SN 6-610,142. ATMOSPHERIC CONTRAST TRANSMITTANCE MONITOR.
SN 6-614,190. X33 CUT QUARTZ FOR TEMPERATURE COMPENSATED SAW DEVICES.
SN 6-615,506. HARNESS FORMATION END-EFFECTOR WITH INTERCHANGEABLE TOOL CAPABILITY.
SN 6-615,612. OPTICAL FLIP-FLOP SYSTEM.
SN 6-617,666. MULTILAYER CERAMIC CAPACITOR.

DEPARTMENT OF THE ARMY

SN 6-628,091. OPTICAL FIBER SPLICE SLED.
SN 6-628,553. PRECISION CUTTING OF MILLIMETER WAVE FERRITE MATERIALS.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancelation will be proceeded with as in the case of default.

Pennington Manufacturing Co., Inc., Columbia, S.C., Reg. No. 836,786, for the mark "YALE AND DESIGN", Canc. No. 14,202.

Paintmaster Systems Corp., Johnstown, Pa., Reg. No. 937,799, for the mark "PAINTMASTER", Canc. No. 14,274.

The Walter Brewing Co., Pueblo, Colo., Reg. No. 811,100, for the mark "GOLD LABEL", Canc. No. 14,294.

Albro Packing Co., assignee, by merger, change of name and assignment, of The Albro Packing Co., d/b/a Apco Packing Co., Springboro, Pa., Reg. No. 571,299, for the mark "MILL CREEK", Canc. No. 14,372.

Plushbottom & Peabody Ltd., New York, N.Y., Reg. No. 1,157,676, for the mark "YES!", Canc. No. 14,379.

ERMA S. BROWN,
Deputy Clerk of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Registration to Practice

The following list contains the name of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of any of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Nov. 12, 1984.

WILLIAM FELDMAN,
Sept. 20, 1984. *Director, Office of Enrollment and Discipline.*

Bahn, Peter R., 253 High Path Rd., Windsor, Conn. 06095
Baird, James F., South Main St.-On the Common, West Brookfield, Mass. 01585
Cabello, Jesus D., 6819 Escondido, Houston, Tex. 77083
Finnegan, Martha A., 125 Trull La. East, Lowell, Mass. 01852
Harrington, Curt, 11000 Crescent Moon, #102, Houston, Tex. 77064
Long, Thad G., 3409 S. Brookwood Rd., Birmingham, Ala. 35223
Mingle, John O., 2408 Buena Vista Dr., Manhattan, Kans. 66502
Porcari, Damian, 597 Bayside, Detroit, Mich. 48217
Schindler, Edwin D., 1523 E. 4th St., Brooklyn, N.Y. 11230
Vincent, Lester J., 204 Columbia Hgts., Apt. 3-C, Brooklyn, N.Y. 11201
Wolfeld, Warren S., 193 Sixth Ave., Brooklyn, N.Y. 11217

PATENT NOTICES

Certificates of Correction for the Week of Oct. 16, 1984

Pp. 5,251	4,412,482	4,439,577	4,447,171
Re. 31,616	4,412,511	4,439,864	4,447,314
D. 268,299	4,414,269	4,440,056	4,447,403
D. 272,097	4,415,082	4,440,164	4,447,463
D. 274,086	4,415,864	4,440,192	4,447,505
D. 274,217	4,416,962	4,440,424	4,447,544
D. 274,218	4,417,379	4,440,446	4,447,718
4,028,804	4,417,831	4,440,690	4,447,869
4,175,136	4,418,053	4,440,949	4,447,960
4,236,373	4,418,631	4,441,000	4,448,010
4,278,954	4,419,035	4,441,069	4,448,377
4,280,863	4,421,597	4,441,125	4,448,547
4,311,090	4,423,117	4,441,156	4,448,693
4,314,272	4,426,143	4,441,240	4,448,753
4,328,705	4,426,515	4,441,425	4,448,934
4,332,980	4,427,242	4,441,991	4,449,302
4,338,033	4,429,891	4,442,056	4,449,357
4,338,772	4,430,467	4,442,227	4,449,372
4,347,106	4,430,474	4,442,409	4,449,662
4,349,925	4,431,233	4,442,459	4,450,020
4,352,929	4,433,104	4,442,774	4,450,146
4,355,074	4,433,713	4,442,975	4,450,226
4,357,621	4,434,307	4,443,421	4,450,457
4,362,604	4,434,521	4,443,505	4,450,459
4,368,876	4,435,072	4,443,550	4,450,576
4,371,752	4,435,481	4,443,659	4,450,593
4,372,810	4,435,572	4,443,760	4,451,299
4,373,469	4,435,847	4,443,826	4,451,344
4,377,608	4,437,029	4,443,918	4,451,398
4,385,164	4,437,469	4,444,313	4,451,914
4,387,389	4,437,869	4,445,163	4,451,927
4,388,143	4,438,202	4,445,307	4,452,589
4,391,989	4,438,689	4,445,482	4,454,711
4,399,328	4,438,898	4,445,532	4,455,282
4,399,451	4,439,090	4,445,729	4,457,907
4,401,645	4,439,114	4,445,926	4,458,978
4,403,269	4,439,297	4,446,141	4,459,278
4,407,597	4,439,453	4,446,369	
4,411,835	4,439,561	4,446,565	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Florida	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6670
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 1, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-21-82
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	2-07-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	6-19-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	7-28-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-23-80
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	12-14-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-13-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	5-21-79
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-06-81
DESIGN, GROUP 290—K. L. CAGE, Director	2-22-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	3-12-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-02-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	6-12-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	11-30-81
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	6-02-82

Expiration of patents: The patents within the range of numbers indicated below expire during September 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,339,206 to 3,344,432, inclusive

Plant Patents ..... Numbers 2,764 to 2,769 inclusive

REISSUES

OCTOBER 16, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,705
METHOD AND APPARATUS FOR PRODUCING SPUN YARN

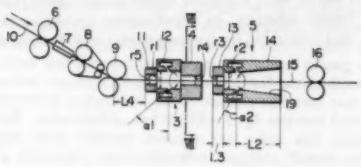
Toshihumi Morihashi, Shiga, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Original No. 4,183,202, dated Jan. 15, 1980, Ser. No. 730,349, Oct. 7, 1976. Application for reissue Jan. 15, 1982, Ser. No. 339,786

Claims priority, application Japan, Mar. 4, 1976, 51/23862

Int. Cl.³ D02G *3/38;* D01H *5/28, 7/92*

U.S. Cl. 57—224 **16 Claims**



1. The method of producing a spun yarn comprising the steps of passing a staple fiber bundle through pneumatic twisting means, through an untwisting tube and through a false twisting means in line and in that order with the internal diameter of the untwisting tube being smaller than the internal diameter of the pneumatic twisting means and the false twisting means to effect ballooning of the fiber bundle between the front rollers and the untwisting tube and loosening and slipping of the fibers of the bundle in the pneumatic twisting means.

14. A spun yarn having a uniform direction of twist comprising:

a plurality of fibers, wherein a portion of at least some of said fibers are wound about the exterior of said yarn, each such fiber having one end disposed in the interior of the yarn and the other end exposed on the exterior of the yarn wherein said exposed other ends extend in a substantially uniform angle with respect to the axis of the yarn.

Re. 31,706
DEVICE FOR CLOSING BAGS

Eduardo De Lima Castro Neto, Rua Sao Luiz Gonzaga, 912, 20.000 Rio de Janeiro, Brazil

Original No. 4,175,782, dated Nov. 27, 1979, Ser. No. 885,043, Mar. 9, 1978. Application for reissue Nov. 16, 1981, Ser. No. 321,835

Int. Cl.³ B65D *33/34*

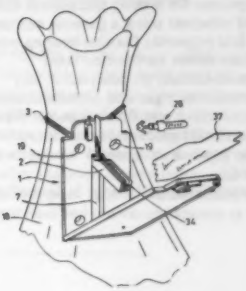
U.S. Cl. 292—307 R **12 Claims**

1. A device for closing bags comprising:

(a) a lever provided with means for fixing one end of a string or the like to at least one point along its length and a guide for the string or the like at a fixed point on the lever which is spaced from a first end thereof;

(b) an element defining an open topped elongated cavity for the lever and having means for fixing the other end of the string or the like to at least one point thereof, said element being provided with string guide means disposed substantially axially with respect to the cavity and a support in said cavity for said first end of the lever so that, on placing the lever within the cavity, the contact point between said first end and the support lies between the guide on the lever and the guide means on said element, defining approximately a straight line; and

(c) a closure member for closing said top of the cavity with the lever therein, said closure member and said element being provided with means permitting their immobilization with respect to each other by the application of a security seal, said string fixing means on at least one of said element and lever defining a plurality of fixing points to



permit the adjustment of the length of the string or the like.

Re. 31,707
METHOD AND APPARATUS FOR ELECTRICALLY BIASING DEVELOPING ELECTRODE OF ELECTROPHOTOGRAPHIC DEVICE

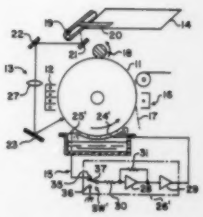
Seiichi Miyakawa, Nagareyama, and Tadahiro Eda, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Original No. 4,050,806, dated Sep. 27, 1977, Ser. No. 575,328, May 7, 1975. Application for reissue Oct. 23, 1980, Ser. No. 199,836

Claims priority, application Japan, May 10, 1974, 49-52010; Jun. 14, 1974, 49-67714

Int. Cl.³ G03G *15/10*

U.S. Cl. 355—14 R **22 Claims**



1. A method of electrically biasing a developing electrode disposed closely adjacent to a photoconductive member of an electrophotographic device after the photoconductive member has been charged and exposed to a light image, comprising the steps of:

a. automatically sensing *with a plurality of sensors* the potential remaining at a plurality of respective portions of the photoconductive member and automatically selecting the lowest value of the sensed potential; and

b. automatically applying biasing voltage to the developing electrode in accordance with the lowest value of the sensed potential.

Re. 31,708

METHOD OF DEPOSITING ELECTRICALLY CONDUCTIVE, INFRA-RED REFLECTIVE, TRANSPARENT COATINGS OF STANNIC OXIDE

Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138

Original No. 4,146,657, dated Mar. 27, 1979, Ser. No. 737,064, Nov. 1, 1976. Application for reissue Jul. 5, 1983, Ser. No. 510,967

Int. Cl.[3] H01B *1/08*; H05B *3/14*

U.S. Cl. 427—126.2 55 Claims

1. A process for making transparent films of stannic oxide on a heated substrate using a gaseous mixture initially containing

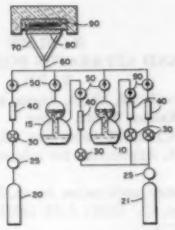
(1) a first organotin fluorine-bearing compound which is free of any direct tin-fluorine bond

(2) an oxidizable, tin compound, and

(3) an oxidizing gas said process comprising the steps of:

(a) converting said first organotin fluorine-bearing component of said gaseous mixture into a second organotin fluoride gaseous compound having a direct tin-to-fluorine bond;

(b) immediately oxidizing, in immediate proximity to said substrate, the second fluoride compound to obtain a fluorine dopant in the gaseous mixture;



(c) and forming a fluorine doped stannic oxide film, on said heated substrate, by simultaneous deposition thereon of said oxidizable tin compound and said fluorine dopant.

PLANT PATENTS

GRANTED OCTOBER 16, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,293

CARNATION PLANT

Leonard E. Carrier, 1911 Sheridan Rd., Encinitas, Calif. 92024

Filed Sep. 27, 1982, Ser. No. 425,116

Int. Cl. A01H *5/00*

U.S. Cl. Plt.—71 **1 Claim**

1. A new and distinct cultivar of carnation plant designated Felicia substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a very vigorous and free-breaking plant habit, and strong and straight stems; superior resistance to the soil-borne diseases such as *Fusarium oxysporum* and *F. roseum* and rots such as damping off, water molds, and the like; large serrated flowers which open fully without bursting the calyx and causing "splits"; a distinctive and attractive magenta flower color which eventually fades evenly and beautifully; and good heat tolerance which is superior to that of the parent lines and the variety known as "Sim".

5,294

CARNATION PLANT

Leonard E. Carrier, 1911 Sheridan Rd., Encinitas, Calif. 92024

Filed Sep. 27, 1982, Ser. No. 425,115

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct cultivar of carnation plant designated Lady Di substantially as herein shown and decribed, characterized particularly as to novelty by the unique combination of a very vigorous and free-breaking plant habit, and strong and straight stems, superior resistance to soil-borne diseases, including *Fusarium oxysporum* and *F. roseum* and rots such as damping off, water molds, small, finely, serrated flowers which open fully without bursting the calyx and causing "splits", a distinctive and attractive magenta flower color which fades evenly and beautifully, and good heat tolerance which is superior to that of the parent lines and the variety known as "Sim".

5,295

ROSE PLANT CV. 'ARONANCE'

Herbert C. Swim, and Jack E. Christensen, both of Ontario, Calif., assignors to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Aug. 31, 1982, Ser. No. 413,497

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, being particularly characterized in that its large pastel hued flowers are borne singly on long, strong stems, its tall, well-branched bushy habit and large deep green foliage, its large, long pointed buds that open in a classic spiral form and its vigor and profusion of bloom.

PATENTS

GRANTED OCT. 16, 1984

ERRATA

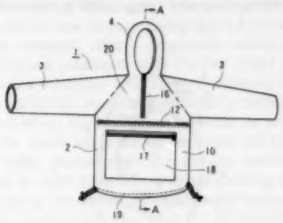
For CLASS	See PATENT NO.
446–166	4,476,648
446–411	4,476,649
446–362	4,476,650
339–059	4,477,022
364–409	4,477,169
137–093	4,477,329
346–205	4,477,593
338–257	4,477,789

PATENTS

GRANTED OCTOBER 16, 1984

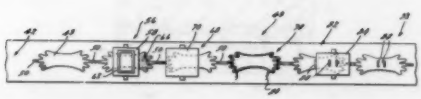
GENERAL AND MECHANICAL

4,476,587
CONVERTIBLE GARMENT
Toru Itoi, 861-11 Komatsuri-cho, Kishiwada-shi, Osaka, Japan
Filed Jan. 4, 1983, Ser. No. 455,483
Int. Cl.³ A41D *1/00*
U.S. Cl. 2—94 **10 Claims**



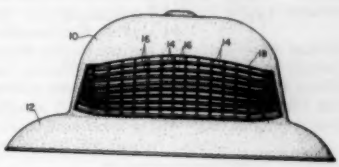
1. A convertible article useful as outerwear and as a carrying bag or knapsack, comprising:
- a trunk portion adapted to fit over the torso of the wearer's body and having sleeves extending therefrom;
- said portion including a front part and a back part;
- a neck-receiving opening at the upper part of said trunk portion for allowing passage of the wearer's head when said article is worn;
- a hood portion about said opening;
- first and second fastener tracks extending transversely across said front and back parts respectively;
- said tracks constituting fastening means along with a slider;
- a drawstring at the lower edge of said trunk portion, said drawstring having ends extending outside said trunk portion;
- hook means near the opposite ends of said second fastener track adapted to receive said ends of said drawstring so that said article can be carried on the shoulders as a carrying bag or knapsack with the portion of said article above said fastener tracks in the rest of said trunk portion with said fastener tracks fastened together with said slider; and
- an opening in said trunk portion formed by said lower edge of said trunk portion.

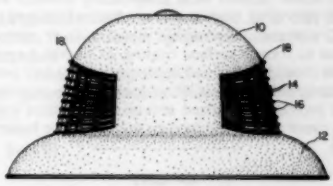
4,476,588
HAND CARE GLOVE PRODUCT AND METHOD OF MAKING SAME
Daniel C. Long, 14314 Hamilton, Riverview, Mich. 48192
Filed Jul. 19, 1982, Ser. No. 399,324
Int. Cl.³ A41D *19/02*
U.S. Cl. 2—169 **17 Claims**



1. A disposable hand care glove product comprising,
- first and second glove side elements fabricated of a relatively thin plastic film material,
- each of said elements having oppositely extending finger receiving areas and juxtapositioned palm receiving areas,
- said side elements being disposed in face-to-face aligned relationship and being sealingly interconnected to one another around the entire periphery thereof so as to define a pair of glove members arranged in wrist-to-wrist connected relationship,
- a hand care product disposed interjacent said side elements, and
- separating means permitting convenient separation of said pair of glove members from one another and simultaneously providing access into the interior of said member so that a person's hands can be inserted into said members and thereby have skin contact with said hand care product disposed therewithin,
- said product being produced by the method of:
- providing a continuous supply of said first glove product side element,
- applying said hand care product to one side of said first glove product side element,
- providing a continuous supply of said second glove product side element,
- aligning the first and second side elements and arranging said side elements in face-to-face relationship, and
- sealingly interconnecting the first and second elements of said glove product around the entire periphery thereof so that said hand care product is self-contained therein.

4,476,589
VENTILATED HAT
Ralph C. Burgin, Westpoint, Iowa, and David B. Cale, Hamilton, Ill., assignors to Dadant & Sons Inc., Hamilton, Ill.
Filed Nov. 16, 1981, Ser. No. 321,813
Int. Cl.³ A42B *1/18*
U.S. Cl. 2—184.5 **4 Claims**





1. In a unitary helmet made entirely of plastic which comprises:
- a central dome-shaped portion that is convex in an upward direction,
- a brim portion extending outward and downwardly from the lower periphery of said central dome-shaped portion and
- ventilating means located in said dome-shape portion, the improvement being that said ventilating means comprises
- two spaced apart sets of ventilating openings, one set extending along each side on the central dome-shaped portion of the helmet,
- each set of openings comprising at least 100 separate openings of generally rectangular configuration, each separate opening being disposed in a generally vertical plane,
- the individual openings in each set being formed by the

intersection of two generally vertical spaced apart rib members with two spaced apart elongated vane members that extend generally horizontally from the front side of the helmet back to the rear side of the helmet, each of said vanes having a generally planar surface which is inclined in an outward and downward direction with respect to the interior of the helmet so as to faciliate the run-off of rain that falls on the helmet,

said generally vertically spaced apart rib members each having portions that extend between said vane members over a length that produces openings of a certain size and disposition such that when one looks from the side of the hat toward the nearest set of openings the openings in the other side of the hat are clearly visible, which is an indication of the ease with which air can flow through the interior of the hat,

whereby generally horizontal air flow from the exterior of the helmet to the interior of the helmet is permitted.

4,476,590

ANTIMICROBIAL SURGICAL IMPLANTS

John T. Scales, Stanmore, and Michael J. Wilkinson, Radlett, both of England, assignors to National Research Development Corporation, London, England

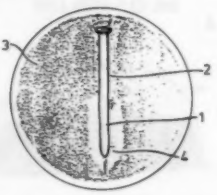
PCT No. PCT/GB81/00058, § 371 Date Nov. 23, 1981, § 102(e) Date Nov. 23, 1981, PCT Pub. No. WO81/02667, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 26, 1981, Ser. No. 328,594

Claims priority, application United Kingdom, Mar. 27, 1980, 8010362; Apr. 3, 1980, 8011429; Oct. 10, 1980, 8032768

Int. Cl.³ A61F *1/04*

U.S. Cl. 3—1.91 **15 Claims**



1. An endoprosthetic implant comprising a permanent implant structure formed of a substantially bioinert structural material providing permanent mechanical integrity to the implant, wherein a bioerodible metallic silver component is deposited to form a surface coating 25 to 500 Angstroms in thickness on said permanent implant structure and provides in vivo a sustained release of silver ions in a concentration sufficient to provide a localized anti-microbial effect but insufficient to cause significant damage to connective tissue.

4,476,591

LENS IMPLANTS FOR INSERTION IN THE HUMAN EYE

Eric J. Arnott, 11-12 Milford House, 7 Queen Anne St., London WIN 9FD, England

Filed Aug. 31, 1983, Ser. No. 528,337

Claims priority, application United Kingdom, Oct. 7, 1982, 8228756

Int. Cl.³ A61F *1/16, 1/24*

U.S. Cl. 3—13 **6 Claims**

1. A lens implant for insertion in the posterior chamber of a human eye after an extra-capsular extraction, said implant comprising a lens of polymethyl methacrylate and first and second similar holding loops formed integrally with and projecting from the periphery of said lens, each of said loops lying substantially in the plane of said lens and being open-ended with one end of said loop integral with said lens and the other end of said loop free, said ends of said loops which are integral with said lens being substantially diametrically opposite each other around the periphery of said lens, and each of said loops, starting from said end which is integral with said lens, including a first portion extending substantially radially outwards from said lens, a sharp bend extending from said first portion, a second portion extending from said bend, said second portion being of a curvature such that is follows, but is spaced radially outwards from, said periphery of said lens, a third portion which extends from, and is of less curvature than, said second portion, and a fourth portion which extends from said third portion and is of a curvature substantially similar to that of said second portion, the end of said fourth portion remote from said third portion being free and lying radially outwards of said

second portion of the other of said loops, whereby said two loops together surround said lens, and said first portion of each of said loops being relatively stiff and the other portions of said loops being more flexible and resilient so that, in use, when said implant is to be inserted through an incision into a human eye, said fourth portion of each of said loops can be pressed inwards into contact with the second portion of the other of said loops, and both said loops bend in such a way that together they form a substantially circular ring surrounding said lens, and, after insertion, said loops spring open again, but the configuration of an encircling ring is maintained and said ring tends to adhere to the underlying posterior lens capsule of said eye.

4,476,592

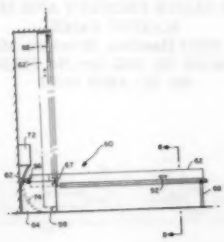
CONVERTIBLE FURNITURE WITH FORCE EQUILIBRIUM AND LATCH MECHANISM

George S. Reppas, Hillsborough, and Gerrit K. Drexhage, San Francisco, both of Calif., assignors to Optimum Space Systems, San Francisco, Calif.

Filed Apr. 5, 1982, Ser. No. 365,374

Int. Cl.³ A47C *19/06*

U.S. Cl. 5—164 B **2 Claims**



1. Convertible furniture comprising a base, a bed frame for holding bedding, means forming a wall cavity, means for carrying the frame at one of its ends for pivotal movement on the base about a transverse axis between a raised position in which the frame and bedding are disposed in an upright orientation within the wall cavity and a lowered position in which the frame and bedding are disposed in a horizontal orientation, a

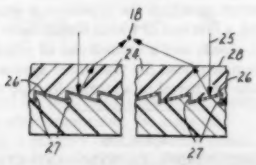
utility module comprising a frame for holding a seat, desk, credenza, chest or workbench and the like, pivot joint means forming on each side of the furniture a parallelogram connection between the frames of the bed, the base and utility module whereby the utility module frame is carried between raised and lowered position conjointly with movement of the bed frame between respective raised and lowered positions, with the points of connection of the pivot joints being established so that when the frames are away from their raised positions their combined weight acts as a gravity moment urging the frames toward their lowered positions, and means for applying a torque moment on the frames when away from the raised positions, said torque moment being applied in a sense opposite the gravity moment with a magnitude which progressively decreases from a maximum with the bed frame in its lowered position and a minimum with the bed frame in its raised position, with the torque moment substantially cancelling the gravity moment when the bed frame is within an arc of 35°to 50° between the raised and lowered positions and with the torque moment being greater than the gravity moment when the frames are in their lowered positions creating a positive net moment urging the frames upwardly, said latch means including at least one lock bolt carried at the proximal end of the bed frame together with actuating means for moving the lock bolt between extended and retracted positions, means for engaging the lock bolt in its extended position for releasably holding the bed frame in its raised position, said lock bolt being mounted for sliding movement transversely of the bed frame, said means for engaging the bolt comprising a detent opening on the base of the furniture, said actuating means comprising at least one actuating rod extending along a side of the bed frame, means for operably interconnecting an end of the actuating rod with the lock bolt, actuating handle means carried on the distal end of the bed frame for operating the actuating rod, said handle means including a first handle mounted on the outerside of the bed frame and operatively coupled with the actuating rod, with the first handle being accessible to an operator when the bed frame is in its lowered position, the handle means further including a second handle mounted in the inside of the bed frame and operatively coupled with the actuating rod, with the second handle being accessible to an operator when the bed frame is in its raised position.

4,476,593

TANNING BLANKET

Dan L. Fanselow, White Bear Lake; Sanford Cobb, Jr., St. Marys Point, and Ronald E. Bergsten, Spring Lake Park, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 9, 1982, Ser. No. 406,353
Int. Cl.³ B32B *3/26, 3/30*
U.S. Cl. 5—417 **7 Claims**



1. A tanning blanket for reflecting incident solar radiation toward a person utilizing said blanket, comprising a flexible substrate including a plurality of elongate facets having a reflective covering thereon, said facets being obliquely oriented to direct incident solar radiation generally toward a focal axis located a predetermined distance above the blanket and approximately midway between two opposing outer edges of the blanket.

4,476,594

REVERSIBLE MATTRESS

Arlis D. McLeod, Rte. 2, Box 211, Leakesville, Miss. 39451

Filed Dec. 6, 1982, Ser. No. 447,216
Int. Cl.³ A47C *27/16, 27/15*
U.S. Cl. 5—464 **12 Claims**

1. A cushion assembly which can be reversed in orientation to expose support cushions having different stiffnesses, said cushion assembly comprising

a stiffener member which includes (1) a plurality of section elements which are positioned in generally abutting side by side relationship to one another, each section element defining a first face, an oppositely directed second face, and side edges, each section member also including an abutment ridge which extends away from its second face adjacent each side edge thereof which is abuttable with the side edge of an adjacent section element, and (2) a hinge means connected between the first faces of adjacent section elements so as to flexibly connect said plurality of section elements together; said abutment ridges on said section elements being abuttable to prevent the movement of adjacent section elements such that their second faces pivot towards one another, and said hinge means connected between said section elements allowing adjacent section elements to move such that their first faces pivot toward one another,

a first support cushion connected to said hinge means, said first support cushion having a unitary structure and a predetermined stiffness, and

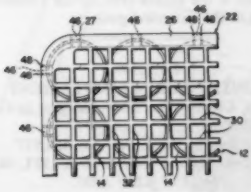
a second support cushion connected to the second faces of said plurality of section elements, said second support cushion having a unitary structure and a predetermined stiffness, the predetermined stiffness of said second support cushion being greater than the predetermined stiffness of said first support cushion.

4,476,595

MATTRESS FOR USE ON A BED AND SETTEE

Minoru Ikeda, Tokyo, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,284
Claims priority, application Japan, Aug. 27, 1981, 56-126715[U]
Int. Cl.³ A47C *23/04*
U.S. Cl. 5—478 **9 Claims**



1. A mattress for use on a bed and settee, comprising:

a spring unit including a plurality of compression springs arranged side by side and connected flat to one another, said spring unit having upper and lower surfaces;

a resilient cushion disposed on at least one of the upper and lower surfaces of the spring unit;

a protective layer disposed between the spring unit and the

cushion so as to prevent the cushion from contacting the spring unit, said protective layer being integrally formed of a synthetic resin and including:

a frame located at the circumference and outside of the spring unit,

a net stretched within the frame, and

a flange extending substantially vertically from the frame to surround the periphery of the spring unit, said frame and flange being stiffer than said net so as to render the peripheral portion of said protective layer less susceptible to elastic deformation than said net; and

an outer covering for covering the spring unit, cushion and protective layer.

4,476,596

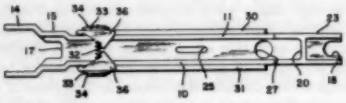
COMBINATION TIP WRENCH AND STAND

William S. Fortune, 29866 Cuthbert St., Malibu, Calif. 90265

Filed Oct. 13, 1981, Ser. No. 310,945

Int. Cl.³ B25F *1/00*

U.S. Cl. 7—138 **3 Claims**



1. A combination tip wrench comprising:

(a) a generally U-shaped metallic member having a top wall and two side walls, said side walls defining from one end thereof a first, a second, and a third width of successively smaller dimensions, the largest width being at said one end;

(b) said top wall extending only from said second width to the other end of said member, whereby said first width forms a first wrench, said top wall forming a first U-shaped opening substantially coincident with said second width, and said third width extending from said other end of said top wall;

(c) a portion extending substantially normal from said top wall and connecting said side walls, said portion being disposed adjacent said second U-shaped opening in said top wall, said portion having a third circular opening therethfough substantially midway of said portion, whereby said second width and first U-shaped opening form a second wrench, and said second opening and third width form a third wrench and said circular opening and third width form a forth wrench; and

(d) a stand including a pair of legs, each leg, when folded, extending along the outer surface of one of said side walls and within said third width, spring means for retaining said legs in their folded position and permitting them to be rotated into an extending position substantially normal to said side walls, and means to the ends of said legs adjacent said side walls in the folded position for releasably retaining said legs in the extended position.

4,476,597

MOUNTAINEERING IMPLEMENT

Gioacchino Gobbi, Courmayeur, Italy, assignor to Grivel S.r.l., Courmayeur, Italy

Filed Sep. 27, 1982, Ser. No. 424,917

Claims priority, application Italy, Oct. 2, 1981, 68276 A/81

Int. Cl.³ B25F *1/00*

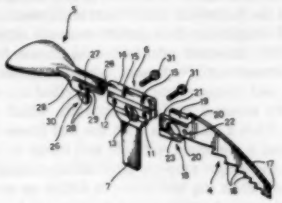
U.S. Cl. 7—159 **4 Claims**

1. Mountaineering implement comprising a handle, a toolhead mounted at one end of the handle and a pair of tools releasably fixed to said toolhead, wherein:

said toolhead comprises a folded sheet-metal blank including two spaced-apart wall portions defining between them an elongate slot open at both ends;

each of said tools has a plate-like appendage slidably engaged in said slot through a respective one of said open ends;

said wall portions each have at least one rib projecting into said slot and extending parallel to the direction of sliding of said appendages in said slot, each of said appendages has grooves in opposing surfaces thereof which receive



said ribs to allow said sliding, and said appendages have complementarily stepped edge portions which contact each other when said appendages are received in said slot; and

releasable locking means locking said appendages in said slot.

4,476,598

COMBINATION ARROWHEAD REMOVING AND MUZZLE-LOADING TOOL

LeR Beauregard, 2496 S. 550 East, Bountiful, Utah 84010

Filed Dec. 24, 1981, Ser. No. 334,319

Int. Cl.³ B25F *1/00*

U.S. Cl. 7—170 **2 Claims**

1. Apparatus for removing arrowheads lodged in trees or the like, where the arrowheads include structure at the rear end thereof for attaching to and detaching from the forward end of an arrow shaft, said apparatus comprising

an elongate shank, one end of which includes means for attaching the shank to the attachment structure of the arrowhead,

weight means disposed on the shank to move therealong, and

stop means located at or near the other end of the shank to prevent movement of the weight means therepast,

said weight means being manually moveable along the shank to apply a striking force against the stop means to thereby effectuate removal from a tree or the like of an arrowhead lodged therein to which the apparatus is attached,

a tamping rod, a first end of which is attachable to said other end of the shank, and a second end of which includes a concave tamping head for placement against a ball to be inserted into the barrel of a muzzle-loading firearm.

4,476,599

FASTENER ORIENTING, TAPPING AND COLLECTION SYSTEM

John H. Steward, Bloomfield Hills, and Harold A. Ladouceur, Livonia, both of Mich., assignors to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 151,549, May 20, 1980, Pat. No. 4,338,694. This application Jul. 6, 1982, Ser. No. 395,410

Int. Cl.³ B23G *1/18, 11/00*

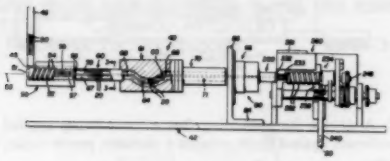
U.S. Cl. 10—139 WH **6 Claims**

1. In a machine for orienting, tapping and collecting a group

of nuts aligned for subsequent delivery to a nut installation means in installation-ready array, each nut having generally flat polygonal end faces, a nut bore extending through said end faces, and flange portions extending from opposite sides of the nut adjacent one end face, the machine comprising:

(a) first conveyor means for advancing said nuts in end face to end face array in a longitudinal feed path;

(b) elongated rod means aligned on said feed path receiving said nut bores including a tapping means forming a female thread in said nut bores, said rod means rotatably jour-



naled and supported on said feed path by means of the randomly oriented nuts advancing on said rod means;

(c) nut orienting means successively receiving said randomly oriented nuts in end face to end face array, said nut orienting means rotating said nuts about the longitudinal axis of said feed path and orienting said nuts in said array with said flange portions aligned in parallel planes; and,

(d) collection means collecting said aligned nuts in a second path transverse to said feed path in side to side abutting installation-ready array and separating groups of said aligned nuts for subsequent installation.

4,476,600

ONE-PIECE, WASHABLE AND STERILIZABLE PLASTIC SHOE

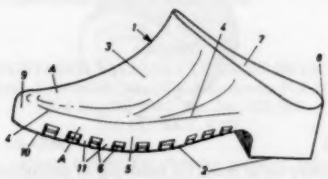
Hartmut Seidel, Hamburg, and Winrich B. Hammerschmidt, Schenefeld, both of Fed. Rep. of Germany, assignors to NATEC Institut, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 171,666, Jul. 24, 1980, Pat. No. 4,408,401. This application Mar. 3, 1982, Ser. No. 354,226

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1979, 2930807

Int. Cl.³ A43B *7/08, 7/06;* B29F *1/00*

U.S. Cl. 12—142 V **9 Claims**



1. A method for producing a one-piece, washable and sterilizable plastic shoe comprising the steps of:

introducing a quantity of a mouldable plastic material, in a fluid state and at an appropriate temperature, into a mould comprising a top-half mould and a bottom-half mould with a correspondingly adapted last located therebetween to form an entire shoe,

simultaneously forming lateral ventilating openings on the shoe being shaped in the last during the introducing step by suitably shaped and arranged pins extending between the last and the bottom-half mould, and

after the plastic material has hardened, opening the mould and removing the entire one-piece plastic shoe therefrom.

4,476,601

WASHING APPARATUS

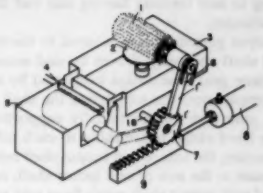
Masahiko Oka, Hikone, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Filed Feb. 3, 1983, Ser. No. 463,423

Claims priority, application Japan, Apr. 17, 1982, 57-64561

Int. Cl.³ A46B *13/02*

U.S. Cl. 15—21 D **6 Claims**



1. In an apparatus for washing silicon wafer type articles, said apparatus comprising a chuck for supporting said article to be washed thereon, a rotary brush having a weight and movable between a first operational position in which said brush is forced against said article, and a second inoperative position in which said brush is spaced from said article, and moving means for alternately moving said brush between said first operational position and said second inoperative position, the improvement wherein, said means for alternately placing said brush between said first operational and second inoperative positions comprises in combination, an elongated arm pivotally attached to a stationary base at one end thereof, said brush being rotatably attached to and laterally extending from the other free end of said arm; adjustable weight means associated with said arm for counteracting the weight of said brush through said arm to reduce the amount of pressure exerted by said brush due to the weight upon said article and to permit said brush to repeatedly rebound on said article when the brush is in operation in said first operational position; and operation selecting means for selectively holding said brush fixed in said operational position and for selectively disabling said counter-acting weight means to force said brush against said article at a constant pressure.

4,476,602

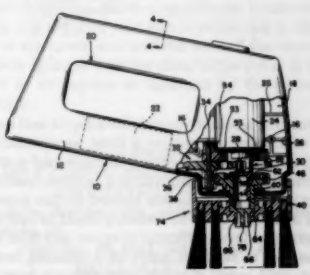
PORTABLE ELECTRIC SCRUBBER

Richard L. Hurn, Ridgely; Gregory C. Harris, Easton, and Herman P. Cox, Ridgely, all of Md., assignors to Black & Decker, Inc., Newark, Del.

Filed Aug. 13, 1982, Ser. No. 408,022

Int. Cl.³ A46B *13/02*

U.S. Cl. 15—28 **15 Claims**



1. A portable appliance comprising:

(a) a housing formed of two half-sections secured together and defining an internal compartment;

(b) a drive motor supported by said housing in said compart-

ment and including a motor shaft and a first drive gear mounted thereon;

(c) a combination gear rotatably disposed on a shaft parallel to said motor shaft and including a reducing gear driven by said first drive gear and a second drive gear coaxially integrally formed with said reducing gear for rotation at a speed reduced from that of said first drive gear;

(d) a hollow, tubular output shaft rotatably disposed in an opening in said housing having one end disposed in said compartment;

(e) an output gear coaxially secured to the one end of said output shaft and being driven by said second drive gear;

(f) one-piece gear case means supported by said housing in said compartment for supporting the shaft of said combination gear and for rotationally supporting said output gear in fixed radial relationship to each other and to said drive motor, the axis of said output shaft being parallel and proximate to the axis of said motor shaft, and axial movement of said output shaft away from said gear case means being unrestricted by said gear case means;

(g) means for restricting axial movement of said output shaft away from said gear case means;

(h) attachement means integral with the other end of said output shaft for releasably engaging an attachment for rotating said attachment with said output shaft;

(i) actuator means manually accessable through an opening in said housing for electrically connecting said drive motor to an electrical power source; and

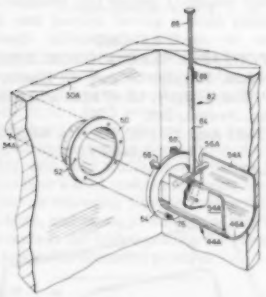
(j) one-piece seal means for sealing against liquid passage between the two halves of said housing, around said output shaft, and through the opening for said actuating means.

4,476,603

DRAINAGE SEAL FOR SEWAGE SYSTEM

George Lukaszewicz, Montreal, Canada, assignor to Shell Canada Limited, Toronto, Canada

Filed Jun. 16, 1983, Ser. No. 504,858
Int. Cl.[3] B08B 9/02
U.S. Cl. 15—104.3 SN 8 Claims



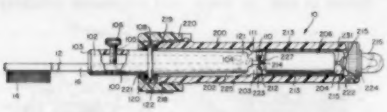
1. A manhole assembly to provide a liquid seal between two sections of a sewer comprising a floor, an upstanding peripheral wall, an inlet duct extending through said wall, an outlet duct extending through said wall at a location spaced from said inlet duct and having a portion located further from said floor than said inlet duct so as to maintain liquid in said manhole at a predetermined level sufficient to cover said inlet duct, and a guide member to facilitate entry of a cleaning tool into said inlet duct, said guide member comprising a base projecting from said inlet duct and a pair of upstanding wings located on opposite sides of said base to project upwardly to a location above said predetermined level, said wings and base partially surrounding said inlet duct such that a cleaning tool inserted between said wings is guided by said base into said inlet duct.

4,476,604

PRESSURE SENSING DEVICE FOR HOLDING A TOOTHBRUSH

Larry W. White, 111 W. Clinton, Hobbs, N. Mex. 88240, and Luis Ingels, Azusa, Calif., assignors to Larry W. White, Hobbs, N. Mex.

Filed May 27, 1983, Ser. No. 498,840
Int. Cl.[3] A47B 9/04
U.S. Cl. 15—105 20 Claims



1. A device for indicating that a force being applied by a toothbrush against teeth exceeds a variable, preset value, comprising:

holding means for holding a toothbrush to allow manual application of force to the toothbrush during toothbrushing to cause pivoting motion of the toothbrush about a pivot point;

adjustment means for adjustably presetting the amount of force required to be applied to the toothbrush to cause said pivoting motion;

sensing means for sensing said pivoting motion when said preset amount of force is applied to said toothbrush; and

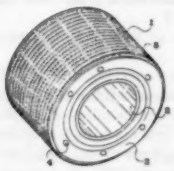
indicator means for indicating when said sensing means senses said pivoting motion.

4,476,605

ROTARY METAL BRUSH FOR REMOVING SUBMERGED ANTI-CORROSIVE COVERING AND METHOD FOR USING THE SAME

Bruno de Sivry, Paris; Guy Hervé; Claude Colas, both of Nantes, and Jean-Louis Caputi, Paris, all of France, assignors to Compagnie Francaise des Petroles, Paris, France

Continuation of Ser. No. 297,464, Aug. 28, 1981, abandoned.
This application Jan. 4, 1983, Ser. No. 455,625
Claims priority, application France, Sep. 9, 1980, 80 19430
Int. Cl.[3] A46B 3/08, 13/02
U.S. Cl. 15—179 11 Claims



1. A rotary metal brush for removing an anticorrosion covering from an immersed metal surface, comprising:

two substantially circular metal plates;

a cylindrical assembly of radial steel wires;

means for axially clamping and compressing said cylindrical assembly of radial steel wires between said two metal plates;

the external diameter of said cylindrical assembly of radial steel wires being greater than the diameter of said metal plates by no more than 20 mm to provide substantial strength and rigidity to said steel wires to facilitate said removal of said anti-corrosion covering;

two discs made of an elastic material, said discs being inserted, respectively, between said two metal plates and said cylindrical assembly of radial steel wires to compress the radially outer free ends of said steel wires in an axial

direction of said cylindrical assembly and form a rigid assembly of steel wires;

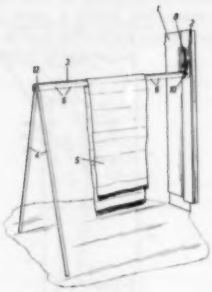
said assembly of radial steel wires forming a plurality of rows, said wires being staggered from one row to the next.

4,476,606

WALL-MOUNTED FOLDABLE AIRING OR CARPET-BEATING STAND

Lars Björkman, and Börje Bang, both of Växjö, Sweden, assignors to Promovo AB, Växjö, Sweden

Filed Jun. 27, 1983, Ser. No. 508,022
Claims priority, application Sweden, Oct. 26, 1982, 8206068
Int. Cl.³ A47L *13/54*
U.S. Cl. 15—268 **3 Claims**



1. An improved wall-mounted foldable airing and carpet-beating stand comprising a bar arranged in position of use of said stand to assume a horizontal position, pivot points at the outer end of said bar, an attachment bracket secured to said wall to support the inner end of said bar, and two support legs pivotally mounted in said pivot points at the outer end of said bar, the improvement comprising

a horizontal shaft mounted in said attachment bracket, said bar mounted for pivotal movement about said horizontal shaft, slits or channel means formed in said attachment bracket, said horizontal shaft arranged for displacement in the vertical direction along said slits or channel means between a lower bar position corresponding to the operational position of said stand, and an upper bar position, in which position said bar may be pivoted to a vertical, non-operational position of said stand.

4,476,607

PORTABLE VACUUM CLEANING DEVICE

David Ross, 1 Louisiana Ave., Lakehopatcong, N.J. 07849

Filed Sep. 30, 1982, Ser. No. 428,650
Int. Cl.³ A47L *9/02*
U.S. Cl. 15—339 **11 Claims**

10. A vacuum cleaner for cleaning surfaces, comprising a vacuum blower means for creating a vacuum, a suction tube and a nozzle assembly, wherein the vacuum created by said blower means is transmitted by said suction tube to the nozzle assembly for vacuuming a surface to be cleaned, the improvement comprising said nozzle assembly which comprises:

a tube means enclosing an interior and comprising a first end, a second end and a series of elongated slots, the first end of said tube means is open for coupling to said suction tube of said vacuum cleaner, so that the interior of said tube means communicates with the vacuum created by said blower means of said vacuum cleaner;

the elongated slots are formed in a longitudinal direction along said tube means so that the vacuum created in the interior of said tube means by said vacuum cleaner communicates with a surface to be cleaned, the elongated slots form a suction plane for drawing material from a surface to be cleaned into said tube means; and

slide means are interposed between the elongated slots to raise the suction plane formed by the longitudinal slots

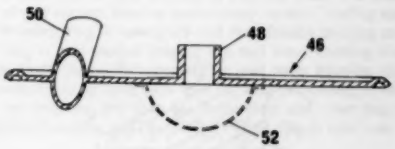
above the plane of the surface to be cleaned, so that an operator can easily slide said nozzle assembly along a surface to be cleaned by means of said suction tube in a side-to-side motion during the vacuuming operation.

4,476,608

APPARATUS FOR REMOVAL OF ASH

Ib R. Rasmussen, Randers, Denmark, assignor to P.I.A. Textiles A/S, Odense, Denmark

Filed Aug. 25, 1982, Ser. No. 411,474
Int. Cl.³ A47L *9/16*
U.S. Cl. 15—353 **5 Claims**



1. An apparatus for removal of ash and the like from open fireplaces or ashpans by means of a vacuum cleaner, said apparatus comprising an airtight ash container, an inlet pipe stub for ash and air and an outlet pipe stub connectable with a suction source, the container comprising a cylindrical barrel with a bottom and an easily mountable and dismountable circular cover carrying the inlet pipe stub and the outlet pipe stub, wherein the outlet pipe stub is perpendicular to the cover in its center zone and the inlet pipe stub is positioned in the peripheral zone of the cover and inclined toward the center of the cover to form an angle with the plane of the cover in the range of from 30 to 85 degrees as indicated by the power of the suction source.

4,476,609

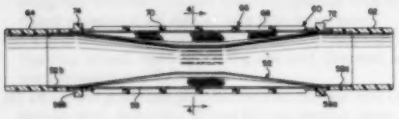
REUSABLE CASING AND CARRIER FOR USE IN PRODUCING SAUSAGE

Philip B. Loudin, Boulder, Colo., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sep. 30, 1982, Ser. No. 430,434
Int. Cl.³ A22C *11/00*
U.S. Cl. 17—1 R **6 Claims**

3. A carrier for releasably retaining a reusable casing member for use in the production of sausage, said casing member comprising an elongated tubular member and a pair of end caps slidably supporting axially movable piston means disposed

within opposed ends of said tubular member, said carrier comprising: supporting body means, yoke means for receiving and locating said casing member relative to said body means, and force imposing means impinging on said piston means to main-



tain a predetermined force against sausage material carried within said tubular member, said yoke means comprises at least two axially spaced pairs of arms extending laterally from said body for embracing said tubular member at axially spaced locations respectively axially inwardly of said pair of end caps.

4,476,610

METHOD AND APPARATUS FOR TRANSVERSELY CUTTING FISH

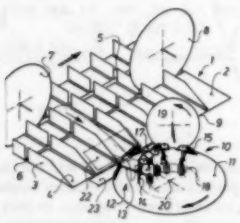
Werner Wenzel, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH and Co. KG, Lübeck, Fed. Rep. of Germany

Filed Sep. 21, 1982, Ser. No. 420,795

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1981, 3138012

Int. Cl.³ A22C *25/18*

U.S. Cl. 17—55 7 Claims



3. An apparatus for mechanically processing fish having a rump defining a longitudinal axis and a tail end including a tail root and a tail fin by producing uniform tail pieces comprising at least part of said tail end, said apparatus comprising trough conveying means having conveying trough means for conveying said fish transverse to said longitudinal axis in a conveying direction with the tail fins projecting from a tail side end of said conveying trough means, at least one cutting means which covers at least the cross-sectional area of said fish when placed in said conveying trough means, displacing means for displacing said fish with said tail end leading, and further comprising abutting means for limiting said displacement of said fish by catching the same at said tail root, wherein holding means which grip said fish in the region of said tail are provided next to said tail side end of said conveying trough means, said holding means performing an accompanying movement with said trough conveying means, said accompanying movement being substantially synchronous with the speed of said trough conveying means but diverging from said conveying direction, and said holding means further being adjustable with respect to the position and duration of their gripping operation.

4,476,611

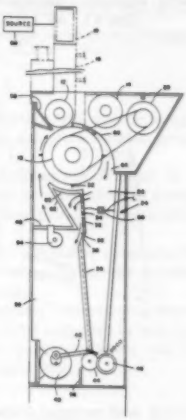
FIBER FEEDING APPARATUS WITH FIBER LEVELING MEANS

Alex J. Keller, Clover, S.C., and Akiva Pinto, Gastonia, N.C., assignors to Automatic Material Handling, Inc., Bessemer City, N.C.

Continuation-in-part of Ser. No. 207,394, Nov. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 190,818, Sep. 25, 1980, abandoned. This application Jan. 19, 1982, Ser. No. 340,635

Int. Cl.³ D01G *15/40*

U.S. Cl. 19—105 13 Claims



1. An apparatus for feeding fibers to textile processing equipment such as a carding machine, said apparatus including an axially extending rotatable opening roller and a substantially enclosed fiber collecting chute means extending generally downwardly beneath said opening roller, said chute means having an open upper and extending along and parallel to the axis of said opening roller to receive fibers as they leave said opening roller and having a wall extending generally downwardly from said open end with a width substantially equal to said axial extent of said opening roller, the improvement comprising:

(a) perforations formed in said chute wall in an area extending across the width thereof and extending above and below the normal level of fibers collected in said chute; and

(b) means for generating a current of air that flows around the upper portion of said roller and generally tangentially therefrom toward said perforations to entrain said fibers leaving said opening roller and to assist in equalizing the level of fibers collected in said chute across the width thereof.

4,476,612

GRIPPING UNIT

Björn G. A. Aren, Kalix, Sweden, assignor to Stiftelsen Prodinor, Lulea, Sweden

Filed May 18, 1982, Ser. No. 379,317

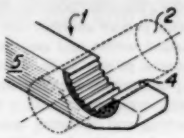
Claims priority, application Sweden, May 18, 1981, 8103082

Int. Cl.³ F16B *11/00*

U.S. Cl. 24—304 11 Claims

1. A gripping unit which by mechanical contact is adapted to interact with an object for maintaining a gripping surface belonging to the gripping unit in a fixed position relative to the object, said gripping unit comprising at least one gripping support connected to the at least one gripping element, a surface of the gripping unit facing the object having at least one hard, gripping element, each gripping element being joined

directly to the gripping element support by a metallurgical atomic bond, the material used for the gripping element support being selected so as to exhibit considerable elastic rigidity and having the same or essentially the same modulus of elastic-



ity as the material used for the gripping element, the gripping element support being a plastic deformable material whose elastic rigidity is at least 30% of the rigidity value of the at least one gripping element of the unit.

4,476,613

FACING HEAD

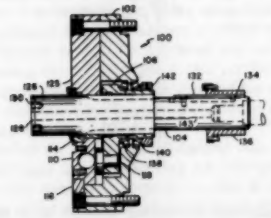
Walter W. Wawrzyniak, 39230 Gary, Mt. Clemens, Mich. 48043

Division of Ser. No. 762,302, Jan. 25, 1977, Pat. No. 4,197,040, which is a continuation-in-part of Ser. No. 641,937, Dec. 18, 1975, Pat. No. 4,004,332. This application Apr. 7, 1980, Ser. No. 138,226

The portion of the term of this patent subsequent to Jan. 25, 1994, has been disclaimed.

Int. Cl.³ B23B *3/26, 7/00*

U.S. Cl. 29—27 C **8 Claims**



7. A facing and boring head adapted to be secured to a spindle for rotation therewith comprising at least one slide transversely slidably supported on one end of the head, an actuating member positioned centrally of the head, means operably between the actuating member and slide for producing movement of the slide transversely of the head on movement of the actuating member axially of the head and a cutting tool for facing secured to the slide, means for simultaneously boring while facing comprising one end of the actuating member extending axially beyond the outer end of the head and a boring tool secured to the one end of the actuating member and means for passing coolant to a workpiece through the facing head axially of the facing head.

4,476,614

METHOD OF ADJUSTING A TWO ROW ROLLING BEARING HAVING ADJUSTABLE PRESTRESS IN THE AXIAL DIRECTION

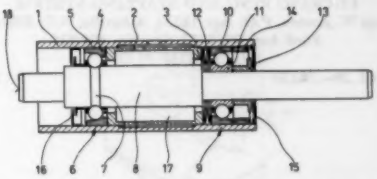
Hans Pittroff, deceased, late of Schweinfurt, Fed. Rep. of Germany, by Irmgard Pittroff, executrix, assignor to SKF Kugellagerfabriken Gmbh, Schweinfurt, Fed. Rep. of Germany

Division of Ser. No. 309,415, Oct. 7, 1981, abandoned. This application Oct. 7, 1983, Ser. No. 540,095

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1980, 3038112

Int. Cl.³ B21D *53/12*

U.S. Cl. 29—148.4 A **2 Claims**



1. A method for assembling a bearing arrangement having prestress in the axial direction, the bearing arrangement having a shaft, a housing having a bore, and a pair of first and second axially spaced rolling bearings, each having inner and outer rings located between the shaft and the bore of the housing, said method comprising the steps of axially affixing said first bearing on said shaft and within said housing, supporting said bearing arrangement on said shaft in a vertical direction, inserting a spring in said housing, to axially abut stop means therein, inserting said second bearing on said shaft and in said housing to engage said spring, inserting inner and outer locating rings on said shaft and in said housing to abut the inner and outer rings of said second bearing respectively, axially loading said inner locating ring downwardly and then fixedly holding said inner ring of said second bearing and said inner locating ring on said shaft, then axially preloading said outer locating ring downwardly, to an extent less than the axial preloading of said inner locating ring, and then fixedly holding said outer ring of said second bearing and the outer locating ring in said bore.

4,476,615

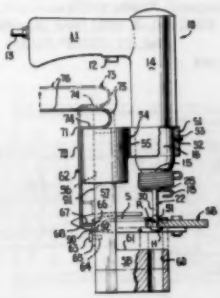
TOOL FOR REMOVING AND REAPPLYING RIVETS

John Cook, Rte. 1, Trimble, Tenn. 38259

Filed Jul. 6, 1982, Ser. No. 395,626

Int. Cl.³ B23P *11/00*

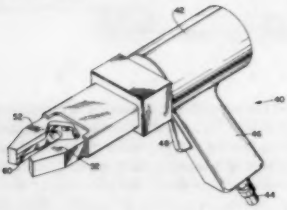
U.S. Cl. 29—243.54 **20 Claims**



1. A power tool adapted for use with power chisel bits to remove old rivets and reapply new rivets relative to an associated riveted element comprising support means for underly-

ingly contactingly supporting an element adjacent an associated old rivet in alignment with a punch bit reciprocated by the power tool, means for removably securing said support means to the power tool, anvil means carried by said support means for underlyingly contactingly supporting a new rivet while a shank thereof is upset by a riveting bit reciprocated by the power tool, means for slidably connecting said support means relative to said securing means, and handle means connected to said support means for manually moving said support means toward said securing means to bring the support means and the associated bit into intimate relationship with the associated rivet.

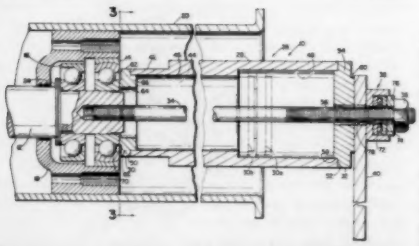
4,476,616
LOCKING RING AND STAPLING SYSTEM
George W. Jensen, P.O. Box 18233, Asheville, N.C. 28814
Filed Aug. 20, 1982, Ser. No. 409,936
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—243.56 **9 Claims**



5. A staple gun for clinching a locking ring having free ends which lie on differing planes prior to clinching, said gun comprising:

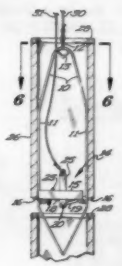
a chamber for holding the ring while the ring is in its open condition; a die connected to said chamber for clinching the ring; means for forcing the ring from said chamber through said die and out of said gun; said die including a feed-through section; said feed-through section being open on its top, its bottom and its far end but closed on its opposing sides; said sides each having a groove; each groove having top, bottom and side surfaces; each side surface being tapered inwardly in the direction of movement of the staple; the top surface of each groove forming a different angle with respect to its side surface than said bottom surface of the same groove.

4,476,617
BEARING INSTALLATION TOOL
Thomas L. Kobylarz, Burlington, Conn., assignor to The Spencer Turbine Company, Windsor, Conn.
Filed Jul. 2, 1982, Ser. No. 394,826
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—264 **8 Claims**



1. A tool for installing a shaft bearing on an end portion of an axially elongated shaft having a tapped central opening in its end, said tool comprising an axially elongated tubular presser member having a first bore therethrough, a presser plate member having an outside diameter not greater than the inside diameter of an associated portion of said first bore, said presser plate member having a mounted position wherein it is engaged with one end of said presser member and a storage position wherein it is contained within said associated portion of said first bore, and a coaxial presser surface defined by one of the members including said presser member and said presser plate member for pressing engagement with a shaft bearing to be installed, and attaching and operating means for securing at least said presser member to the shaft with said presser surface engaged with the shaft bearing and moving said presser member in axial direction relative to the shaft to move said presser surface in the direction of the shaft bearing, said attaching and operating means including a threaded member extending through said first bore for threadably engaging the shaft within the tapped opening, a nut threadably engaged with said threaded member, means for maintaining said presser member in coaxial alignment with said threaded member including a pusher plate engaged with the other end of said presser member opposite said one end and having a second bore receiving the extending portion of said threaded member therethrough, positioning means on said pusher plate and extending into and substantially complementing the other end portion of said first bore for maintaining said pusher plate in alignment with said presser member with said second bore coaxially aligned with said first bore, and bearing means received on said threaded member between said nut and said pusher plate for enabling threadable rotation of said nut on said threaded member and relative to said pusher plate and said presser member.

4,476,618
CONDUIT SETTING IMPLEMENT
William B. Simonson, Jr., 4232 First Ave., Hibbing, Minn. 55746
Filed Aug. 23, 1982, Ser. No. 410,364
Int. Cl.³ B25B *27/04*
U.S. Cl. 29—272 **7 Claims**



1. An implement for setting conduit units in end-to-end stacking relation comprising:

first and second oppositely disposed members resiliently biased in spaced relation to each other;

cleat means extending from said spaced members for supporting a conduit unit;

toggle means having two stable positions, said toggle means being in the space between said members and having arms pivotally joined at one end at a knee and at their other end at a different one of said members;

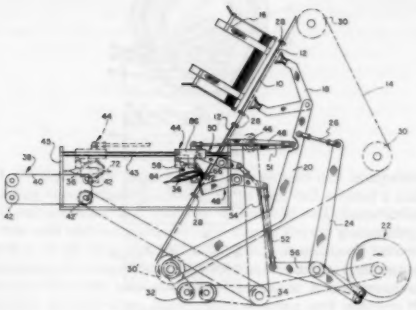
means for flexing said toggle means knee from one of said stable positions to the other; and

means extending from each of said members in mutually opposite directions for engaging a conduit unit supported by said cleat means during flexing of said toggle means.

4,476,619
METHOD AND APPARATUS FOR INSERTING BAGS ONTO CARDS

Charles E. Palmer, Somers, Conn., assignor to Palmer Systems, Incorporated, Somers, Conn.

Filed Jun. 15, 1982, Ser. No. 388,712
Int. Cl.³ B23P 11/00, 21/00; B21D 39/03; B23Q 7/10
U.S. Cl. 29—429 25 Claims



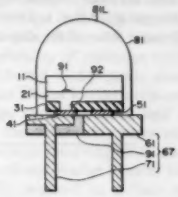
1. In a mechanism for mounting end-flanged bags upon a display card, the latter having a locking tab arrangement comprised of at least one lower locking tab that is displaceable from the plane of the card about a lower hinge portion thereof, and that has an upper edge portion configured to cooperate with a lower edge portion of an adjacent card section to engage the bag flange therebetween, the combination comprising: (a) means for supporting the card in a generally upright position; (b) displacing means for pivoting said tab about said hinge portion to displace it from said plane outwardly of the forward face of the card; (c) means for carrying the bag to a location adjacent the forward face of the supported card with the bag in a generally horizontal position, said carrying means having associated means for gripping the bag with the flange thereof folded downwardly, and being supported for movement at said adjacent location to effect insertion of the flange into the slot formed behind the displaced tab; and (d) return means for forcing the tab, with the folded portion of the bag carried thereupon, back through the plane of the card to partially dispose the folded bag portion therebehind and thereby engage the bag thereon.

19. In a method for mounting end-flanged bags upon a display card, the latter having a locking tab arrangement comprised of at least one lower locking tab that is displaceable from the plane of the card about a lower hinge portion thereof, and that has an upper edge portion configured to cooperate with a lower edge portion of an adjacent card section to engage the bag flange therebetween, the steps comprising: (1) disposing such a card in a generally upright position; (2) displacing the tab forwardly from the plane of the card about its hinge portion to form a slot therebehind; (3) carrying such a bag to a position proximate the forward face of said card with the main body portion of the bag in a generally horizontal position and with the flange thereof folded downwardly; (4) moving said bag to insert said flange into said slot behind said tab; and (5) forcing said tab, with the folded portion of said bag carried thereupon, back through the plane of said card to partially dispose the folded bag portion therebehind and thereby engage the bag thereon.

4,476,620
METHOD OF MAKING A GALLIUM NITRIDE LIGHT-EMITTING DIODE

Yoshimasa Ohki, Sagamihara; Yukio Toyoda, Tokyo; Hiroyuki Kobayashi, Sagamihara, and Isamu Akasaki, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 199,097, Oct. 20, 1980, Pat. No. 4,396,929.
This application Mar. 31, 1983, Ser. No. 480,794
Claims priority, application Japan, Oct. 19, 1979, 54-135641; Apr. 23, 1980, 54-54518
Int. Cl.³ H01L 21/20, 33/00
U.S. Cl. 29—569 L 15 Claims



1. A method of manufacturing a light-emitting diode chip, comprising the steps of:

(a) making rough areas in one surface of a single crystal substrate in such a manner that at least one rough area is in a substrate region which will be each diode chip substrate;

(b) growing a conductive gallium nitride layer on said surface of said substrate;

(c) growing a semi-insulating gallium nitride layer on said conductive gallium nitride layer;

(d) simultaneously growing high conductivity regions in said semi-insulating gallium nitride layer at positions corresponding to said rough areas in such a manner that each of said high conductivity regions extends from said conductive gallium nitride layer to the upper surface of said semi-insulating gallium nitride layer;

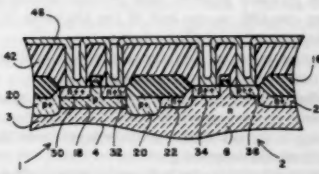
(e) forming first and second electrodes respectively on one of said high conductivity regions and on said semi-insulating layer of each diode chip region; and

(f) cutting a light-emitting diode wafer, which has been manufactured in the above steps, to separate each diode chip from another.

4,476,621
PROCESS FOR MAKING TRANSISTORS WITH DOPED OXIDE DENSIFICATION

Kenneth C. Bopp, Scottsdale; Judith L. Gooden, Phoenix, and Narayan M. Kulkarni, Mesa, all of Ariz., assignors to GTE Communications Products Corporation, Phoenix, Ariz.

Filed Feb. 1, 1983, Ser. No. 462,739
Int. Cl.³ H01L 21/324
U.S. Cl. 29—571 18 Claims



1. In a process for fabricating an integrated circuit in a wafer substrate having transistors including source and drain regions, and gate oxide topped with a polycrystalline silicon layer,

wherein the process includes the steps of producing a protective layer over transistor elements, a doped silicon oxide layer over the protective layer, forming contact apertures which extend through the doped silicon oxide and protective layers so as to expose source and drain regions, and depositing a metallic layer in the apertures for providing contacts to the source and drain regions, the improvement comprising:

heating the doped silicon oxide layer in a high temperature environment for a duration that is sufficient to cause densification thereof prior to said step of forming contact apertures therein, and

performing all steps including and after forming the contact apertures and through depositing the metallic contact layer at a temperature that is lower than the temperature which will cause flow of the doped silicon oxide layer.

4,476,622

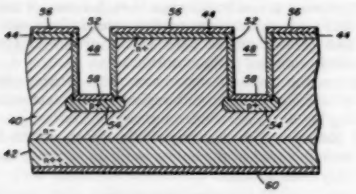
RECESSED GATE STATIC INDUCTION TRANSISTOR FABRICATION

Adrian I. Cogan, Waltham, Mass., assignor to GTE Laboratories Inc., Waltham, Mass.

Division of Ser. No. 334,404, Dec. 24, 1981,. This application Jan. 23, 1984, Ser. No. 573,222

Int. Cl.³ H01L *21/265*

U.S. Cl. 29—571 **3 Claims**



1. A method for forming a gate-source structure for a static induction transistor, said method comprising the steps of:

growing a high resistivity, epitaxial silicon layer on a semiconductor substrate;

forming a source layer on said high resistivity epitaxial silicon layer;

growing a first silicon dioxide layer over said high resistivity epitaxial silicon layer;

etching through said first silicon dioxide layer and source layer and into said high resistivity epitaxial silicon layer to form recessed grooves, said grooves having a depth of from one-fifth to one-half of the thickness of said high resistivity epitaxial silicon layer;

implanting nitrogen into the exposed silicon area at the bottom of said recessed grooves;

annealing said implanted nitrogen to form a silicon nitride layer in said bottom of said grooves;

growing a second silicon dioxide layer over the vertical walls of said recessed grooves;

stripping said silicon nitride from the bottom of said grooves;

doping the bottom of said grooves;

etching to remove said first silicon dioxide layer; and

depositing metal over said structure to form source and gate electrodes.

4,476,623

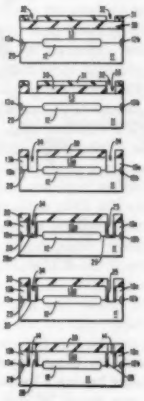
METHOD OF FABRICATING A BIPOLAR DYNAMIC MEMORY CELL

Badih El-Kareh, Milton, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 87,596, Oct. 22, 1979, Pat. No. 4,309,716. This application Jul. 1, 1981, Ser. No. 279,377

Int. Cl.³ H01L *21/302, 21/76*

U.S. Cl. 29—576 W **3 Claims**



1. A method for producing an improved complementrary transistor memory cell comprising the steps of;

providing a silicon substrate of a first conductivity type,

growing a silicon epitaxial layer of a second conductivity type on a surface of said substrate,

diffusing an emitter and a collector region in said epitaxial layer to form a pnp transistor,

diffusing an emitter region in said collector region to form a npn transistor,

the base of said pnp transistor serving as the collector of said npn transistor and forming an integrated pnp-npn complementary transistor cell,

reactive ion etching a plurality of channels through said epitaxial layer and said rectifying junction to expose said surface of said substrate and forming an island of said epitaxial layer,

said channel being isolated from said diffused emitter and collector regions by said epitaxial layer,

said island including a set of said complementary transistors,

growing a silicon oxide coating on the walls of said channel to form a coating of insulating material on the bottom and walls of said channels,

reactive ion etching the insulating material from the bottom of the channel over said substrate to expose said surface, and

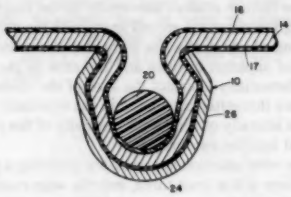
depositing a semiconductor material of the same conductivity type as said substrate on said exposed surface in said channel and in contact with coated walls thereby forming a capacitor for said complementary transistor cell with said substrate being one plate of said capacitor and said base of said pnp transistor being the other plate of said capacitor.

4,476,624

METHOD FOR MAKING SPIRALLY WOUND CELLS

Gerhart Klein, Manchester, and Michael J. Mitchell, Jr., Lynnfield, both of Mass., assignors to Duracell Inc., Bethel, Conn.

Filed Feb. 24, 1982, Ser. No. 351,816
Int. Cl.³ H01M 6/00
U.S. Cl. 29—623.1 3 Claims



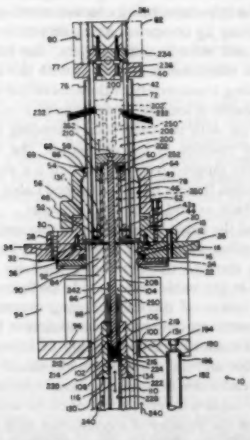
1. A method of making a spirally wound cell comprising winding anode electrode members of said cell around a mandrel and retaining said mandrel within said cell characterized in that said method comprises the step of fixedly positioning a portion of an anode of said cell, which is enclosed between separating elements, between said mandrel and a compression element whereby said portion of an anode is compressively retained therebetween during said winding and wherein the separating element, between the anode and the mandrel, has an aperture therein whereby the fixed positioning of said portion of an anode with said compression element simultaneously electrically connects the anode to said mandrel through said aperture.

4,476,625

APPARATUS OF INSERTING WEDGES INTO THE SLOTS OF A MAGNETIC CORE

Robert W. Bricker, Fort Wayne; Timothy K. Pease, Kendalville; Michael G. Pease, Angola, all of Ind., and Jarvis Kirby, Galapolis, Ohio, assignors to Pease Machine & Tool, Inc., Huntertown, Ind.

Filed Sep. 30, 1982, Ser. No. 430,684
Int. Cl.³ H02K 15/10
U.S. Cl. 29—734 18 Claims



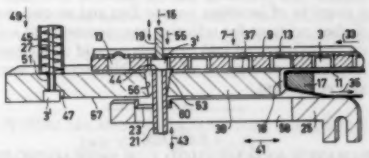
1. Apparatus for inserting retaining wedges into axially extending slots of a magnetic core having axially extending slot entrances in communication with said bore in co-operation with apparatus for inserting coil side turn portions into said slots and including coil side turn feeder blade means for receiving and guiding a plurality of electrical coils into said slots, stripper means for moving said coils from said coil blade means into said core in positions with side turn portions thereof disposed in said slots, the apparatus comprising: a stationary circular array of wedge guide blades encircling said coil side turn feeder blade means and defining there between a plurality of wedge guide slots having cross-sections complementary to the cross-section of a coil retaining wedge and disposed in longitudinal alignment with predetermined portions of said magnetic core slots, a wedge magazine rotatably mounted in axial alignment with said wedge guide blades and having a circular array of wedge receiving slots formed in the surface thereof, said array of wedge receiving slots being congruent with said wedge guide slots, means for incrementally rotating said magazine into a plurality of positions with said slots disposed in alignment with said wedge guide slots, a plurality of elongate wedge inserter blades having cross-sections complementary to said wedge receiving slots, said wedge inserter blades having one end thereof slidably received in a respective end portion of said wedge receiving slots distal said wedge guide blades, the ends of said wedge inserter blades distal said magazine being fixedly secured to a base member, means fixedly connecting said base member to said magazine for conjoint rotation therewith, prime mover means for moving said wedge inserter blades longitudinally through said wedge receiving and wedge guide slots to thereby insert wedges received in said magazine into said magnetic core slots, said base member being rotatably connected to said prime mover means, said stripper means being operatively coupled to said connecting means for movement therewith during a predetermined portion of the movement of said wedge inserter blades.

4,476,626

DEVICE FOR TRANSFERRING LEADLESS COMPONENTS TO A GIVEN MOUNTING POSITION ON A CIRCUIT BOARD

Hans Gumbert, Sinn, and Norbert Eufinger, Limburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,037
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3150945
Int. Cl.³ H05K 3/34
U.S. Cl. 29—740 2 Claims



1. A device for transferring leadless components, in particular so-called chip-type components, from a carrier tape to a given mounting position on a circuit board, the components being supplied by the tape at regular intervals and a punch feeding each component via a feeding channel in a guiding bottom to a transfer slide, characterized in that

a suction pick-up is arranged below the punch, which can be displaced axially and synchronously with the punch, whilst the component is aligned between the suction pick-up and the punch on its way towards the transfer slide in the feeding channel and is prevented from being separated from the suction pick-up until the component reaches the bottom of a slide chamber in the slide, and

said suction pick-up, projecting into a slot of the transfer slide, after the component has been disposed on the bottom of the slide chamber and after the suction pick-up has

been lifted off the component, maintains a sub-atmospheric pressure, which further holds the component on the bottom of the slide chamber until the component has been transferred by means of the transfer slide into a position above the mounting position and is lifted out of the slide chamber by a suction tube.

4,476,627

AUTOMATIC ASSEMBLING MACHINE

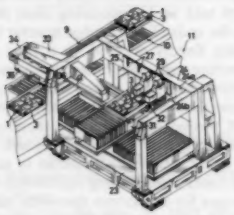
Tamiaki Matsuura; Takeshi Aiba; Takashi Fukushima; Masanori Nishimura; Hiroshi Ohtsuki, all of Kanagawa; Fujio Yabuki, Saitama, and Tomio Kusakabe, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 23, 1982, Ser. No. 391,472

Claims priority, application Japan, Jun. 24, 1981, 56-93507[U]; Jun. 27, 1981, 56-95936[U]

Int. Cl.³ B23P *19/00, 21/00*

U.S. Cl. 29—791 **11 Claims**



1. A machine for automatically assembling equipment composed of parts at least some of which are arranged on a carrier comprising:

movable table means for supporting said carrier and moving in two orthogonal directions in a horizontal plane;

tray means supported on said table means for movement with the latter and adapted to carry elements for use during said assembling;

mounting surface means extending above said plane of said movable table means and having first and second mounting surface portions parallel to said two orthogonal directions, respectively; and

at least one working unit means releasably attached to at least one of said first and second mounting surface portions of said mounting surface means at a selected one of a plurality of locations on said first and second mounting surface portions for selective engagement with said parts on the carrier and said elements on said tray means upon respective movements of said table means in assembling said equipment.

4,476,628

APPARATUS AND METHOD FOR SPREADING WIRES IN A CABLE AND CONNECTING THE WIRES TO TERMINALS

Gerald H. Kees, Jr., Kernersville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 23, 1982, Ser. No. 361,005

Int. Cl.³ H01R *43/04;* **B23P** *19/00*

U.S. Cl. 29—861 **18 Claims**

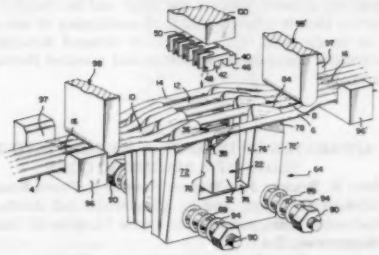
1. A method of connecting wires to terminals, the wires being in coplanar side-by-side parallel relationship in a cable, the terminals being in cavities in an electrical connector, the cavities being in side-by-side relationship in a row, the center-to-center spacing of adjacent wires in the cable being less than the center-to-center spacing of adjacent cavities in the connector, the method being characterized in that:

the cable is positioned proximate to the row of cavities in the connector with the axes of the wires in the cable extending substantially normally of the axes of the cavities and with the axis of a central wire in the cable substantially intersecting the axis of a central cavity in the row,

the wires on each side of the central wire are spread in opposite directions laterally of their axis and in the plane of the cable, the spreading step being carried out by moving relatively a stack of side-by-side spreading fingers towards and through the cable, the spreading fingers having convergently tapered free ends which move between adjacent wires in the cable so that upon further relative movement of the fingers through the cable, the wires are spread apart until the center-to-center spacing of adjacent wires is equal to the center-to-center spacing of adjacent cavities and the axes of the individual wires substantially intersect the axes of the cavities and

the wires are thereafter connected to the terminals by moving the wires laterally of their axes, normally of the plane of the cable and into the cavities.

4. A mass wire insertion apparatus for inserting a plurality of n wires, where n is at least three, into the wire-receiving cavities of an electrical connector or the like, the cavities being in side-by-side relationship in a row, the apparatus being of the type comprising a connector jig for holding the connector in a predetermined position and a wire locating jig proximate to the connector jig for locating the wires in side-by-side spaced-apart parallel relationship with each wire extending transversely of, and being in alignment with, one of the cavities, the apparatus being intended for use with wires in a flat cable, the wires in the cable being in side-by-side coplanar relationship



with the center-to-center spacing of adjacent wires being less than the center-to-center spacing of adjacent cavities in the connector, the apparatus being characterized in that:

the wire locating jig comprises a plurality of at least n-1 cable spreading and wire-locating fingers, the fingers being in side-by-side relationship in a stack with the axes of the fingers extending transversely of the axes of the wires in a cable when the cable is located proximate to a connector in the connector jig with the cable axis extending transversely of the row of cavities in the connector, the fingers having convergently tapered free ends which are proximate to the cable, adjacent fingers having opposed cable spreading side surfaces which extend from the free ends,

the fingers and the cable being movable relatively towards and past each other so that the free ends of the fingers move completely through the cable until they are between adjacent wires in the cable and the side surfaces of the fingers spread the wires of the cable during movement until the center-to-center spacing of adjacent wires in the cable is the same as the center-to-center spacing of adjacent cavities in the connector and the wires are in alignment with the cavities, the spread wires being in co-planar relationship with the wires in the cable whereby, portions of the wires of the cable which are in the vicinity of a connector held in the connector locating jig are spread apart so that the individual wires are each located in alignment with one of the cavities in the connector, and the individual wires can thereafter be moved laterally of their axes and into the cavities of the connector.

4,476,629
METHOD AND APPARATUS FOR PRODUCING WIRE HARNESS

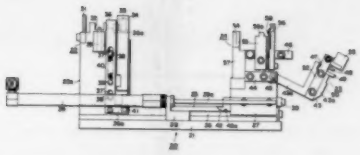
Yoshitsugu Suzuki, Mishima; Shogo Iizuka, Gotenba; Shigeo Kajiyama, Shizuoka; Kenji Usui, Gotenba; Masahiro Kobayashi, Susono; Toshinori Igura, Gotenba; Shigezi Kudo, Gotenba, and Sanae Suzuki, Gotenba, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Oct. 5, 1981, Ser. No. 308,599

Claims priority, application Japan, Nov. 20, 1980, 55-163704; Nov. 28, 1980, 55-167804; Nov. 28, 1980, 55-167805; Nov. 28, 1980, 55-167806; Nov. 28, 1980, 55-167807

Int. Cl.³ H01R *43/04*; B23P *23/00*

U.S. Cl. 29—863 **33 Claims**



1. A method of automatically producing a wire harness by use of a plurality of wiring blocks arranged on a workbench at spacings which conform to an intended design of a wire harness, each wiring block having a wire clamping section, a wire cutting section and a terminal press attaching section, said wire cutting section and said terminal press attaching section being adapted for movement toward and away from said wire clamping section, said method comprising the steps of

(1) laying an insulated wire from one wiring block to another wiring block, the wire cutting section and the terminal press attaching section of each wiring block being integrally assembled and supported on a bed with the wire clamping section, to ensure that each wire clamping section clamps the wire while cutting said wire to leave at least one piece of insulated wire having a predetermined length extending on said two wiring blocks;

(2) separating said wire cutting section and terminal press attaching section from said wire clamping section to define a predetermined gap therebetween;

(3) peeling an end portion of the laid wire to remove insulating covering therefrom;

(4) moving said terminal press attaching section to the wire clamping section and;

(5) attaching a terminal to end portion of the laid wire by means of a terminal press.

18. An apparatus for producing a wire harness comprising a workbench slidable along a plurality of stations to travel from one station to another;

a plurality of wiring blocks arranged on said workbench at spacings which conform to an intended design of a wire harness and each having a wire clamping section supported on a bed, a wire cutting section supported on said bed, and a terminal attaching section supported on said bed, said wiring cutting section and said terminal attaching section being mounted on carrier means movable on said bed whereby they can be moved toward and away from the wire clamping section; a wiring head provided above one of the stations to lay at least one piece of insulated wire between any selected wiring blocks, means movably supporting said wiring head and operable to locate said wiring head at a desired position with respect to said selected blocks, said wire cutting section and terminal attaching section being kept in close contact with the wire clamping section during said laying of the wires;

a peeling assembly provided in association with another one of the stations, means mounting said peeling assembly for movement relative to the terminal clamping section to face the wire clamping section such that an end portion of the laid wire is subjected to a peeling operation to remove insulating covering therefrom, said wire cutting section and said terminal attaching section being kept away from the wire clamping section to define a space to receive the peeling assembly during the peeling operation; and

a terminal press attaching assembly provided in association with a further one of the stations, means being provided to move said terminal press attaching assembly relative to the terminal attaching section.

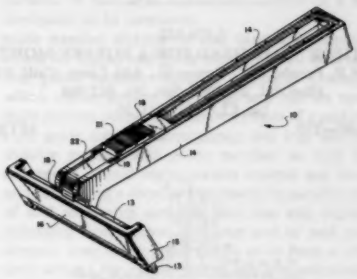
4,476,630
RAZOR WITH SLIDING BLADE COVER

David S. Byrne, Atlantic Highlands, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 21, 1981, Ser. No. 332,986

Int. Cl.³ B26B *21/02*

U.S. Cl. 30—47 **3 Claims**



1. In a disposable wet shaving razor of the type having a guard bar, a permanently attached cover overlaying the razor and slidable relative to the guard bar along a first track defining a first line of action from a first position in which the relationship between the cover and the guard bar renders the razor operable to a second position in which the relationship between the cover and the guard bar renders the razor inoperable, a mechanism for driving the cover relative to the guard bar comprising a slidable operating button, a flexible element connecting the cover to the button and a second track defining a second line of action for guiding the button so that sliding motion of the operating button along the second track drives the cover selectively along the first track to said first and second positions, said flexible element curving from said first line of action to said second line of action, said cover, said flexible element and said operating button being fixed together to define a unitary assembly and said tracks being substantially perpendicular to one another.

4,476,631
CUTTING MEANS MAGAZINE FOR A STERILE DOCKING APPARATUS

Joshua Benin, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

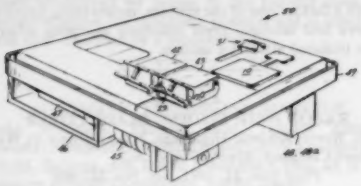
Filed Aug. 16, 1982, Ser. No. 408,415

Int. Cl.³ B23D *21/00*

U.S. Cl. 30—92 **13 Claims**

1. A cutting means magazine for use in an apparatus for forming a connection between two thermoplastic tubes comprising a casing, a stack of disposable cutting means therein, and spring means urging the stack against a wall of the casing; said casing having an exit slot for ejection of the uppermost cutting means of the stack and a cutting means ejector slot for accommodating an ejector, said slot being centrally located in the wall against which the stack is urged and having an upstream access opening to the cutting means and a downstream cutting means access opening which has the exit slot as part thereof; the upstream access opening (a) having an ejector aligning surface with a rise of at least about 0.25 mm and a

slope of up to 45° and (b) being from about 50% to about 100% of the cutting means thickness; the downstream access opening



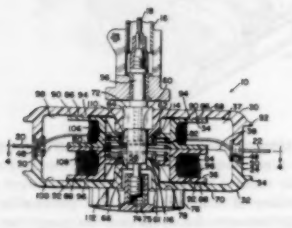
being from about 10% to about 80% greater than the cutting means thickness.

4,476,632

MULTIPLE FLAIL HEAD FOR A ROTARY MOWER

Raymond E. Proulx, 5837 Cameo St., Alta Loma, Calif. 91701

Filed Jul. 29, 1982, Ser. No. 402,944
Int. Cl.³ A01D 35/26
U.S. Cl. 30—276 18 Claims



1. A mower for cutting vegetation having at least one cutting flail extending outwardly from a spinning assembly, and comprising:

means for generating rotary motion,

means for transmitting rotary motion connected with the means for generating rotary motion, and

a rotatable cutting head connected with the means for generating rotary motion by the means for transmitting rotary motion, said cutting head including:

first and second housing members, each having a cylindrical side portion defining at least one orifice, a central cylindrical portion, a radially extending portion interconnecting the side portion to the central portion, and a radial abutment surface on the cylindrical side portion opposite from the radially extending portion, said first and second housing members being so positioned that their radial abutment surfaces are in confronting relation to define a chamber between the first and second housing members,

first and second spools mounted on said central cylindrical portions in said chamber, each spool having wound thereon at least one flail for extension through one of said orifices, and

means to selectively limit relative rotation between the first spool and the first housing member and between the second spool and the second housing member, including means to selectively hold said first and second housing members together,

first releasable abutment means on the first spool and second releasable abutment means on the first housing member, said first and second releasable abutment means being configurated and arranged to lock the first spool and first housing member together when said means for selectively holding are holding the first and second housing members together, and to allow restrained relative rotation of the first spool and first housing member when the means for selectively holding are not holding the first and second housing members together, and

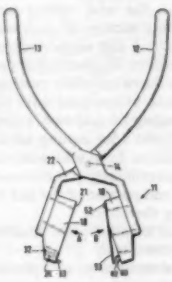
third releasable abutment means on the second spool and fourth releasable abutment means on the second housing member, said third and fourth releasable abutment means being configurated and positioned to lock together the second spool and second housing member when the means for selectively holding are holding the first and second housing members together, and to allow restrained relative rotation of the second spool and second housing member when said means for selectively holding are not holding the first and second housing members together.

4,476,633

PLIERS FOR PUNCHING CARDS OR TICKETS

Heinz Brych, Caspar Olevianstrasse, 5500 Triert, Fed. Rep. of Germany

Filed Dec. 30, 1981, Ser. No. 335,857
Int. Cl.³ B26F 1/36
U.S. Cl. 30—363 13 Claims



1. A pair of pliers for perforating small cards, which pliers have:

two double-arm levers pivotable about a geometrical transverse axis and end zones which serve for perforating, each zone having a plane, which planes are parallel to said transverse axis and which, in the closed state of the pliers, are approximately parallel to each other,

at least one punching pin vertically positioned in one plane,

a punch hole corresponding to said punching pin, in the opposite end zone, which is vertical to the plane thereof; and the improvement comprising:

two positioning pins in one end zone oriented vertically to the plane thereof, which pins, measured in one of said two planes, are at a specific center distance from said transverse axis,

a first coding box provided in one end zone,

a second coding box provided in the other end zone,

said coding boxes contain said punching pin and said punch hole respectively,

said coding boxes being sufficiently smaller, with respect to symbol identification, in the direction parallel to said positioning pins, than the space between said positioning pins.

4,476,634

CYLINDER GAUGE

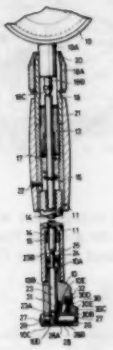
Takeshi Yamamoto, and Masao Nakahara, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 422,417

Claims priority, application Japan, Oct. 23, 1981, 56-157825[U]

Int. Cl.³ G01B 3/26, 5/12

U.S. Cl. 33—178 R 6 Claims



1. A cylinder gauge for measuring holes, including shallow holes, in workpieces, comprising:

a head;

a cylinder body extending fixedly upward from said head;

means for securing an indicating device to the upper end of said cylinder body;

a spindle operatively connected to said indicating device and axially movable along said cylinder body;

a measuring element slidably supported on said head for axial movement in the radial direction of said spindle, said measuring element engaging said spindle for mutual axial movement, the bottom end of said spindle and the inner end of said measuring element having inclined surfaces at which said spindle engages said measuring element for converting an axial movement of said measuring element into an axial movement of said spindle;

a first biasing means operatively connected to said spindle for biasing said measuring element in a direction for projecting from said head and thereby for biasing the outer end of said measuring element to abut against the inner wall surface of a hole in a workpiece for measuring such hole;

a guide member slidably mounted on said head in a direction parallel to the axis of said measuring element;

a second biasing means for biasing said guide member in a direction projecting from said head;

the bottom of said head being flat and substantially perpendicular to the axis of said cylinder body, said measuring element being axially slidable in a bore closely adjacent to the flat bottom of said head and substantially parallel thereto, to facilitate measurement of even very shallow holes in workpieces;

interengaging groove means on said head and guide member for slidably guiding said guide member on said head in a direction substantially parallel to the axis of said measuring element, said guide member protruding from said head in the same direction as said measuring element, said measuring element having an outer end portion facing away from said head, said guide member having an outer end portion also facing away from said head, the outer end portion of said guide member having an outer end surface extending in a plane substantially perpendicular to the measuring element axis and substantially parallel to the spindle axis, the measuring element and guide member having rest positions in which the outer end portion of said guide member overlies and protectively covers the outer end portion of said measuring element.

5. A cylinder gauge for measuring holes, including shallow holes, in a workpiece, comprising:

a head;

a cylinder body extending fixedly upward from said head;

means for securing an indicating device to the upper end of said cylinder body;

a spindle operatively connected to said indicating device and axially movable along said cylinder body;

a measuring element slidably supported on said head for axial movement in the radial direction of said spindle, said measuring element and spindle having coactive means for converting axial movement of said measuring element into axial movement of said spindle;

first biasing means for biasing said measuring element axially outward of said head toward the surface of a hole in a workpiece to be measured;

a guide member slidable on said head and second biasing means for urging said guide member away from said head, said guide member being of generally U-shaped plan which opens toward said head and has an upstanding bight portion connecting the outer ends of a pair of spaced legs, guide means interengaging said legs and head for slidably guiding said guide member on said head for movement of said bight portion toward and away from said head along a direction substantially parallel to the axis of said measuring element, said legs and bight portion extending from below the outer end of said measuring element over the top thereof so as to form a protective arch around the major part of the circumference of the outer end portion of the measuring element.

4,476,635

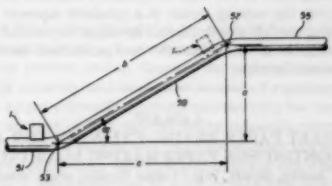
METHOD OF DETERMINING LENGTH OF A CONDUIT HAVING ENDS AT DIFFERENT ELEVATIONS

George V. Hart, 9846 Sagedowne La., Houston, Tex. 77089

Filed Feb. 25, 1982, Ser. No. 352,466

Int. Cl.³ G01B 3/10

U.S. Cl. 33—228 4 Claims



1. The method for using a combination retractable measuring tape and protractor for determining the inclined distance from the position of the tool, which is resting at a first point to an elevated second point not readily reached by the user thereof in order that such user can accurately fabricate a structural component for bridging between said first and second points, comprising the steps of:

positioning the combination tool at said first point and ascertaining the horizontal posture thereof in order to facilitate accurate measurement of the angle of inclination to the second point;

withdrawing the measuring tape in horizontal fashion and extending it to a position directly beneath the aforementioned second point;

measuring the distance from the position of the tool at the first point to the aforementioned position beneath said second point;

visually sighting from said tool along said protractor to said second point, so as to ascertain the angle of inclination thereof; and

retrieving the distance information from point 1 to point 2 by use of the information achieved through operation of the combination tool hereabove.

4,476,636

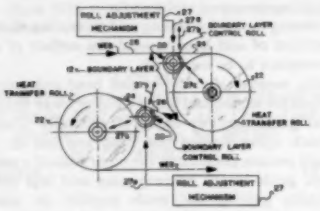
BOUNDARY AIR LAYER MODIFICATION STRUCTURE FOR HEAT TRANSFER ROLL

Frank R. Gross, 3926 Woodthrush Rd., Akron, Ohio 44313

Continuation-in-part of Ser. No. 200,765, Oct. 27, 1980, abandoned. This application May 14, 1982, Ser. No. 378,478

Int. Cl.³ F26B *13/08*

U.S. Cl. 34—114 **13 Claims**



1. Apparatus for effecting boundary air layer modification for a heat transfer roll being structurally positioned to receive a web therearound wherein heat transfer is occasioned between the web and the roll which comprises

means mounting the heat transfer roll in rotatable journaled condition;

means to pass the web around the heat transfer roll forming a nip at the point of contact of the web with the heat transfer roll;

wiping means in immediately proximate adjacent relationship with the heat transfer roll as close as possible to the nip to mechanically squeeze the air boundary layer from the heat transfer roll as it approaches the nip, such means also having the web in close proximity thereto and to the nip to mechanically wipe the boundary layer of air from the underside of the web immediately adjacent to the nip, wherein the wiping means is a rotatable squeeze roll extending the full length thereof arranged in parallel relation thereto, but of small diameter and positioned immediately adjacent the nip.

4,476,637

SHEET PAPER DRYING CYLINDER FOR A CONTINUOUS PAPERMAKING MACHINE

Edgar J. Justus, Beloit, Wis.; Udino Stedile, and Umberto Bolani, both of Torino, Italy, assignors to Beloit Corporation, Beloit, Wis.

Filed Jun. 9, 1982, Ser. No. 386,743

Claims priority, application Italy, Jun. 9, 1981, 67792 A/81

Int. Cl.³ F26B *13/08*

U.S. Cl. 34—119 **10 Claims**

1. A steam heated cylindrical dryer drum for continuously drying a traveling paper web in a papermaking machine comprising in combination:

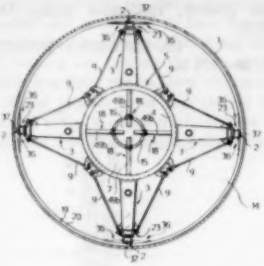
a rotary mounted cylindrical dryer drum having an outer shell with a smooth outer surface with heads at the ends defining a steam containing cavity within;

annular ribs on the inner surface of the shell defining axially spaced grooves in which condensate collects during drying operation as heat is transferred to a web on the drum surface;

a plurality of elongate collector tubes within the drum each having a supporting base end and having a condensate collection free end projecting into a groove and extending in a generally tangential direction being formed of an elastically deflectable material;

a condensate collector rigidly supporting the base end of the tubes with the tubes biased toward the shell so that said free ends tend to move toward the shell;

and a tube positioning element secured to the tube at the free



end in supporting engagement with the inner surface of the shell adjacent the grooves fixedly positioning the free end a predetermined distance from the bottom of the groove.

4,476,638

FLEXIBLE WOODEN INSOLE AND UNDERLYING SUPPORT

Florindo Quacquarini, and Florindo Severini, both of Via Circonvallazione, 103, Monte San Giusto (MC), Italy

Filed Mar. 11, 1983, Ser. No. 474,327

Claims priority, application Italy, Mar. 15, 1982, 19405/82[U]

Int. Cl.³ A43B *1/06, 13/38, 3/12*

U.S. Cl. 36—86 **8 Claims**

1. A flexible insole to be placed within a shoe, boot or the like comprising in combination:

a flexible substrate dimensioned to be received within the shoe,

a plurality of wooden slats having bottom faces fastened to an upper surface of said substrate, each slat oriented parallel to one another and transverse to the longitudinal axis of the shoe, and each slat spaced from an adjacent slat,

whereby upper faces of said slats come in direct contact with the bottom surface of a person's foot wearing the shoe and said slats can articulate one relative to another to accommodate foot flexure while allowing proper thermal aspiration of the foot,

wherein said spaces between adajcent slats is constant for all slats,

wherein top longitudinal edges of said wooden slats are provided with a contoured surface whereby articulation of adjacent slats precludes pinching of the skin of the foot supported thereon, and

wherein said flexible substrates includes portions thereof interposed between adjacent side faces of said wooden slats.

4,476,639

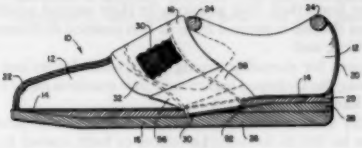
NO LACE SHOE WITH ADJUSTABLE STRAP FASTENING MECHANISM

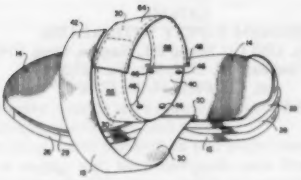
Gary S. Zaccaria, Sandy, Utah, assignor to Inventor's Technology Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 415,645, Sep. 7, 1982,. This application Jul. 28, 1983, Ser. No. 517,942

Int. Cl.³ A43B *5/00, 11/00*

U.S. Cl. 36—114 **38 Claims**





24. An ajustable strap fastening mechanism for securing and supporting a wearer's foot within a shoe which has an upper, an insole and an outer sole, comprising:

fastening means for securing the foot within the shoe having first and second members which join in locking engagement; said first member being connected to the shoe upper;

a pull strap having a connecting end attached to the insole of the shoe and a fastening end; said second member being connected to said pull strap proximate to said fastening end; said pull strap disposed to encircle the wearer's foot in a wrap-around manner by passing from one side of the foot over the instep to the opposite side of the foot, then through the structure of the shoe subtending the foot, and by exiting the shoe for connecting said first and second members of said fastening means in locking engagement; and

adjustment means for adjusting the tautness of said pull strap about the wearer's foot to provide adjustable support to the arch of the foot.

4,476,640

DEVICE FOR CONTROLLING THE FLEX OF SKI AND THE LIKE BOOTS

Giuseppe Aldinio, Treviso, and Giorgio Baggio, S. Martino Di Lupari, Italy, assignors to Nordica S.p.A., Montebelluna, Italy

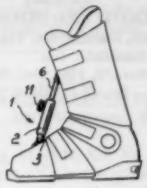
Filed Nov. 24, 1981, Ser. No. 324,370

Claims priority, application Italy, Dec. 2, 1980, 26385 A/80; Dec. 2, 1980, 23531/80[U]

Int. Cl.³ A43B *5/04*

U.S. Cl. 36—121 **5 Claims**

1. A device for controlling the flex of a first portion of a ski boot or the like with respect to a second portion of said ski boot movable with respect to said first portion, comprising a cylinder pivoted to one of said portions and a piston slidable in said cylinder and having a piston rod pivoted to the other of said portions, said piston dividing said cylinder into two chambers having a fluid therein and means for biasing movement of said piston in said cylinder, wherein said means comprise fluid passages between said two chambers of said cylinder at opposite sides of said piston and means for controlling fluid flow through said passages, the means for controlling fluid flow from one of said chambers to the other of said chambers being



separate and independent from the means for controlling fluid flow from said other of said chambers to said one of said chambers.

4,476,641

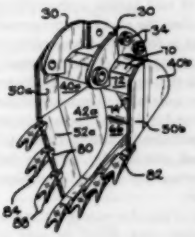
STRATA ROCK BUCKET

Paul V. Ballinger, 7630 Westwood, Findlay, Ohio 45840

Continuation of Ser. No. 251,471, Apr. 6, 1981, abandoned. This application Jul. 1, 1983, Ser. No. 510,383

Int. Cl.³ E02F *3/00, 9/28*

U.S. Cl. 37—118 R **14 Claims**



1. An excavating bucket for use with backhoes and similar machines comprising, in combination, a bucket assembly having a top portion, means disposed on said top portion for removably securing said bucket to associated equipment, a first pair of upper sidewalls disposed substantially but not parallel to one another, a first pair of lower sidewalls intersecting a respective one of each of said first pair of upper sidewalls along a first pair of hip lines, said first pair of lower sidewalls extending from a respective one of each of said first pair of upper sidewalls away from said top portion and toward one another at an acute angle, a bottom panel extending between said first pair of lower sidewalls, a back wall extending between said bottom panel and said top portion, a second pair of upper sidewalls extending between a respective one of said first pair of upper sidewalls and said back wall and disposed substantially but not parallel to one another, a second pair of lower sidewalls intersecting a respective one of each of said second pair of upper sidewalls along a second pair of hip lines, said second pair of lower sidewalls extending between a respective one of said first pair of lower sidewalls and said back wall, said first pair of lower sidewalls defining a respective pair of inclined leading edges extending from said bottom panel in a diverging manner generally toward said back wall and said top portion to said first pair of hip lines, and a plurality of teeth disposed in mirror-image pairs on said pair of leading edges and in substantially uniformly spaced-apart position along the length of said leading edges between said bottom panel and said first pair of hip lines, said bucket having its maximum width at said hip lines, the width of said bucket decreasing in both upper and lower directions from said hip lines and said

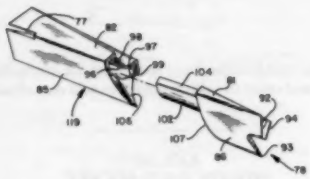
bucket having its most widely spaced pair of said teeth located substantially at said hip lines.

4,476,642

DIGGING TOOTH AND HOLDER ASSEMBLY

Charles W. Hemphill, Duncanville, Tex., assignor to Hemphill Industries, Inc., Mansfield, Tex.

Filed Nov. 30, 1982, Ser. No. 445,396
Int. Cl.³ E02F 9/28
U.S. Cl. 37—142 R **22 Claims**



1. In a digging apparatus of the type having a digging tooth removably received within a tooth receiving holder, wherein the holder is affixed to the digging apparatus and includes a socket formed therewithin within which a shank of the tooth is removably received, the improvement comprising:

said socket of said holder outwardly opens and rearwardly tapers to that the socket is progressively reduced in size; said socket is formed by spaced curved interior wall surfaces joined together at spaced locations along the circumference of the spaced wall surfaces to form an arc, the interior peripheral wall surface of the socket is continuous when viewed in lateral cross-section;

said tooth includes a cutting head at one end thereof, said tooth shank rearwardly extends from said cutting head and is rearwardly tapered complementary respective to said socket;

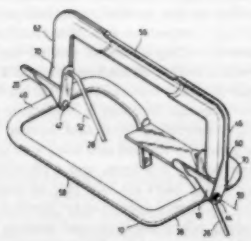
said shank is of annular configuration when viewed in lateral cross-section; said shank of said tooth is telescopingly received within said socket of said holder where said shank is wedgedly held in assembled relationship therewith.

4,476,643

HAND CONTROL SYSTEM FOR MOTORIZED IMPLEMENTS

Robert M. Hilchey, Kitchener, and Arne I. Fors, Nobleton, both of Canada, assignors to MTD Products Limited, Kitchener, Canada

Filed Mar. 8, 1983, Ser. No. 473,387
Int. Cl.³ E01H 5/09; G05G 1/04
U.S. Cl. 37—245 **9 Claims**



1. A control system for a motorized implement comprising:

(a) a U-shaped handle;

(b) two control levers, pivotally mounted on the U-shaped handle, one end of each being pivotally moveable from a first inoperative position distal from the handle to a second operative position proximate to the handle;

(c) a U-shaped bail, pivotally mounted on the U-shaped handle, the bight of which being pivotally moveable from a first inoperative position distal from the handle to a second operative position proximate to the handle, said bail adapted to bear against the control levers and move them from their first positions to their second positions when the bail is pivoted from its first position to its second position; and

(d) means for normally biasing the control levers and for biasing the U-shaped bail to their first positions distal from the handle;

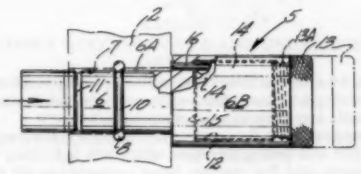
whereby each control lever may be independently pivoted from its first to its second position; or both control levers may be conjointly pivoted by the bail from their first to their second positions.

4,476,644

FIREARM SAFETY WITH ALARM

Jerry R. Laing, 1383 Cal Young Rd., Eugene, Oreg. 97401

Filed Sep. 29, 1982, Ser. No. 427,594
Int. Cl.³ F41C 27/00, 17/00
U.S. Cl. 42—1 A **4 Claims**



1. A safety device for a firearm to provide a signal to a shooter that a firearm safety is off and the firearm is ready to fire, said device comprising in combination,

a main body member adapted for support by the trigger guard structure of the firearm in a manner permitting limited rectilinear movement of the main body member to a first position to obstruct trigger operation and movement to a second position to permit normal trigger operation, and

an alarm system carried by said main body member, said alarm system including a power source, signal generating means, switch means in circuit with said power source and said signal generating means, said switch means closeable upon said main body member being manually positioned to said second position permitting normal trigger operation and energizing said signal generating means indicating to the shooter that the firearm is ready to fire.

4,476,645

FISHING POLE HOLDER

James Paarmann, R.R. 4, Box 2, Girard, Kans. 66743

Filed Oct. 18, 1982, Ser. No. 434,954
Int. Cl.³ A01K 97/12
U.S. Cl. 43—15 **7 Claims**

1. A fishing rod holder comprising:

stake means for insertion into the ground;

bracket means rigid with said stake and extending upwardly therefrom;

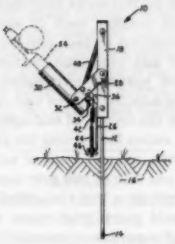
pivotal arm means coupled with said bracket means for pivotal movement relative thereto between a cocked position and a hook setting position;

socket means for receiving an end of said rod, said socket

means being coupled with said arm means at a point spaced from the point of coupling of said arm means with said bracket means to effect generally upward movement of said socket means to set a fish hook depending from the rod when said arm means moves from the cocked to the hook setting position;

a latch plate rigidly mounted on said pivotal arm means and non-movable therewith;

a latch having a notch therein, said latch being pivotally coupled with said bracket means for pivotal movement between a latching position wherein the latch plate is engaged in said notch to hold said arm means in the



cocked position and a release position wherein the notch is displaced from the latch plate;

camming means mounted on said socket means at a location to engage said latch and push same from the latching position to the release position by camming action when said socket means is pulled generally downwardly;

first yieldable means for biasing said latch toward the latching position; and

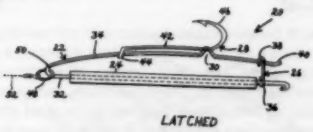
second yieldable means for biasing said arm means toward the hook setting position to effect setting of the hook when said latch is moved to the release position by said camming means.

4,476,646

FISHING LURE

Stephan E. Weiman, 4029 S. LaFayette, Bartonville, Ill. 61607

Filed Jun. 9, 1983, Ser. No. 502,507
Int. Cl.³ A01K *83/02*
U.S. Cl. 43—34 **11 Claims**



1. A fishing lure comprising:

a spring wire member of resilient material being formed in a V shape having two legs diverging rearwardly from an apex providing a connection for the fishing lure;

a trigger member slidably engaging one of said legs and being movable back and forth thereon, and having a catch position engageable with the other leg member;

a fishing hook carried by the other of said legs at an intermediate position thereon;

said legs being resiliently compressible toward one another to provide a contracted profile attractible to a fish;

said trigger member being movable along said one leg from a "latched" position with the catch portion thereof engaging said other leg and holding the two legs in their said contracted profile, to a "released" position disengaging the other leg and enabling it to spring outwardly; and

means supported on said one leg with the trigger member and engageable by a fish when swallowing the lure to move the trigger member backwardly to its said released position in response to backward pull by the fish;

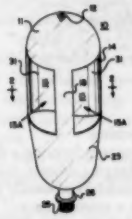
whereby such backward pull exerted on the lure by the fish automatically moves the trigger member from the "latched" position of the "released" position, enabling said other leg to spring outwardly and automatically set the fishing hook in the fish's mouth.

4,476,647

JAPANESE BEETLE TRAP

Howard R. Hall, Jr., 1065 W. Bristol Rd., Warminster, Pa. 18974

Filed Aug. 11, 1982, Ser. No. 407,178
Int. Cl.³ A01M *1/10*
U.S. Cl. 43—122 **9 Claims**



1. A Japanese beetle trap comprising

a top portion,

a cylindrical portion having openings for access of beetles to the interior and with struts therebetween,

a lower part with a receptacle carried thereby for discharge of beetles into the receptacle,

a plurality of vertically extending curved baffles mounted on said struts and having flanges with openings therethrough for passage of scent to lure the beetles, and

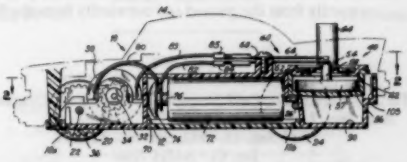
said flanges enclosing a bait receiving space.

4,476,648

FLOAT ACTIVATED TOY VEHICLE

John Maxim, 25 Mill Valley La., North Stamford, Conn. 06903

Filed Feb. 4, 1983, Ser. No. 463,749
Int. Cl.³ A63H *17/00*
U.S. Cl. 446—166 **25 Claims**



1. A device comprising a toy vehicle frame, driven means at least simulating means for propelling said frame coupled to said toy vehicle frame, motor means supported on said frame operatively coupled to said driven means for driving same, reservoir means carried on said frame having an opening, said reservoir means being capable of receiving and accumulating a liquid, switch means supported on said frame and coupled to said motor means for actuating said motor means, and float means supported in said reservoir means, said float means being buoyantly displaceable by said liquid between a first position where said switch means is actuated by said float means when at least a predetermined amount of said liquid is present in said reservoir means and a second position where said switch means remains unactuated when less than said at least predetermined amount of liquid is present in said reservoir means.

4,476,649

TOY DOLL STROLLER AND FERRIS WHEEL

John V. Zaruba, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 20, 1982, Ser. No. 451,174
Int. Cl.³ A63H 5/00
U.S. Cl. 446—114 **20 Claims**

1. A stroller comprising:
spaced parallel members forming a frame;
a pair of ground engaging wheels, each mounted for rotation of a stub shaft extending inwardly from a respective frame member to form a common axis;
means extending between the frame members below the common axis to connect the frame members together proximate the ground engaging wheels;
a pair of spaced side wheels mounted on an axle and carried by the frame for rotation with the periphery of the side wheels spaced from the ground;
a concentric, inwardly disposed drive wheel portion on one of the ground engaging wheels in direct drive engagement with the periphery of one of the side wheels;
a plurality of pivot means on the spaced side wheels spaced at approximately the same distance from the axle and at approximately equal intervals;
a seat pivotally depending from each of the pivot means between the spaced side wheels and passing between the ground engaging wheels below the common axis during rotation of the spaced side wheels;
the length of the seat depending from the pivot means being less than the distance between the pivot means and the axle and less than the distance the side wheel periphery is spaced from the ground; and
handle means connected to the frame members projecting upwardly from the ground and outwardly from the frame.

4,476,650

TRIGGER ACTUATED PUPPET

Tor Lokvig, Encino, Calif., assignor to Intervisual Communications Inc., Los Angeles, Calif.

Filed Sep. 13, 1982, Ser. No. 417,675
Int. Cl.³ A63H 7/00
U.S. Cl. 446—362 **6 Claims**

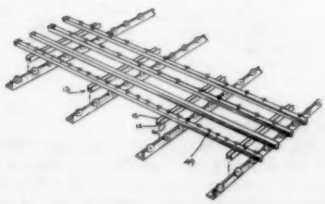
1. In a puppet, a figure having a main body portion with a plurality of articulated limbs and a control therefor, said control comprising pistol grip means connected to the back of said figure, said grip means having a plurality of openings therein for insertion of the fingers of the operator of said puppet, said grip means further having a plurality of limb control members pivotally mounted thereon and accessible from said openings, and flexible members interconnecting said control members and said limbs whereby movement of said control members at said openings moves said flexible members thereby moving the limbs of said figure, each of said control members including a first elongated portion extending toward said figure and terminating in a free end, and a second curved portion extending from said elongated portion away from said figure and integral with said elongated portion, each of said control members being pivotally connected to said grip means substantially at the intersection of said elongated portion and said curved portion, the curved portions terminating in ends normally disposed partway in selected ones of said openings in said grip means for access by the fingers of said operator, and abutment means on said grip means for limiting the pivotal movement of said control members, selected ones of said control members being mounted on one side of said grip means and the remainder of said control members being mounted on the other side of said grip means, said pistol grip means being generally L-shaped with first grip portion connected to said figure and a second grip portion, having said openings therein, extending downwardly from said first grip portion, the elongated portions of said control members extending along said first grip portion and the curved portions of said control members extending in said second grip portion to and partway in said openings, said control members on each side of said grip means including first and second control members, said first control members having their elongated and curved portions substantially longer than the elongated and curved portions of said second control members and overlying the same with the ends of said curved portions on one side of said grip means extending into staggered ones of said openings.

4,476,651

APPARATUS AND METHOD FOR TRANSPORTING GROWING PLANTS

Geoffrey Drury, P.O. Box 127, Granite Ave., Canaan, Conn. 06018

Filed Jan. 27, 1983, Ser. No. 461,513
Int. Cl.³ A01G 15/00
U.S. Cl. 47—65 **7 Claims**



1. Apparatus for supporting, positioning and transporting plants in a hydroponic growing system, the apparatus including a plurality of elongated troughs, each trough having an inlet end, an opposite outlet end, a bottom portion, and at least one longitudinally extending external rib depending from said bottom portion; means for supporting said troughs in spaced parallel relation so that the inlet end of each trough is at a first level and the outlet end is at a second level lower than the first level; means for delivering a flow of liquid nutrient to the inlet end of each trough; and means for collecting a flow of liquid nutrient from the outlet end of each trough, wherein the improvement comprises said means for supporting, positioning

and transporting said troughs in spaced parallel relation including:

at least two spaced apart rails extending under the troughs transversely to the longitudinal axes thereof;

a multiplicity of wheels rotatably mounted on each rail, the axes of rotation of the wheels perpendicularly intersecting at spaced intervals a longitudinal axis of the rail such that part of the rim of each wheel extends above the top of the rail; and

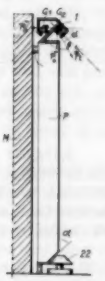
at least two elongated spacer bars disposed end-to-end on each rail, each spacer bar having a longitudinal bottom groove engaged by the rims of a plurality of the wheels, such that the bar makes rolling contact with the wheels and is guided thereby along the rail, and at least one upright rib extending longitudinally along the top of the bar, said rib having at least one notch in the upper edge thereof for transversely receiving the bottom rib of a respective trough, whereby the spacer bars maintain the troughs in spaced relation.

4,476,652

DEVICE FOR SUSPENDING A SLIDABLE SEALED DOOR

Pierre Beauchot, Blaincourt sur Precy, France, assignor to Fermod, France

Filed Jul. 27, 1982, Ser. No. 402,331
Claims priority, application France, Aug. 5, 1981, 81 15209
Int. Cl.³ E05D *15/56*
U.S. Cl. 49—235 **9 Claims**



1. In a device for suspending a slidable sealed door for a wall defining a doorway, said device comprising a guide rail having a cross-section in the general shape of a C for fixing to said wall and defining two guide surfaces along which surfaces the door is movable between an opening position and a closing position relative to said doorway, a first of said guide surfaces having a notch, door support means mounted on the door, at least one first rolling or sliding element carried by the door support means and cooperable with the first guide surface in a first contact region, at least one pivotal arm connected to the door and pivotable about a pivot axis substantially parallel to said guide surfaces, at least one second rolling or sliding element carried by the at least one pivotal arm, a second of said guide surfaces cooperating with said at least one second element in a second contact region, said first element being adapted to enter said notch when the door is moved to said closing position for lowering the position of said pivot axis and pivoting said at least one pivotal arm and thereby displacing the door toward said wall for compressing sealing means between the door and said wall; the improvement wherein the at least one pivotal arm is disposed completely within the C-section rail and said pivot axis is located above said contact regions in positions of the door other than said closing position thereof and is located no lower than said contact regions in said closing position of the door.

4,476,653

DOOR SILL AND ADJUSTABLE THRESHOLD

Wayne Speer, Temple, Tex., and John M. Chupik, Box 1008, Temple, Tex. 76501, assignors to John M. Chupik, Temple, Tex.

Filed Jan. 10, 1983, Ser. No. 456,763
Int. Cl.³ E06B *1/70*
U.S. Cl. 49—468 **1 Claim**

1. A combined door sill and adjustable threshold comprising an elongate wooden sill having opposite longitudinal edge portions,

a tread portion inclined upwardly from one longitudinal edge portion and an elongate upwardly-open groove adjacent the other longitudinal edge portion, said groove having laterally spaced side walls and a bottom wall extending therebetween,

an elongate threshold strip slidably engaging in the groove and substantially spanning the space between the side walls of the groove,

a yieldable foam plastic filler with closed cells engaged between the threshold strip and the obottom of the groove,

said filler occupying the entire space between the bottom of the threshold strip and the bottom wall of the groove and extending from side wall to side wall of said groove,

and screw and nut means respectively in the strip and groove bottom for driving the threshold strip upwardly and downwardly in the groove,

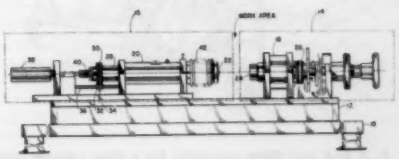
said threshold strip having outwardly extending overhanging ledges along each side thereof, said ledges overhanging the sill adjacent each side of the groove.

4,476,654

SPLINE GEAR RECIPROCATING LAPPING MACHIE

Berwyn S. Eng, and Earl L. Christian, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 23, 1982, Ser. No. 410,275
Int. Cl.³ B24B *15/08*
U.S. Cl. 51—26 **14 Claims**



1. An apparatus for rapid, consistent and automatic lapping of involute and straight internal and external spline gears comprising:

a support bed;

a headstock assembly attachable to the support bed which includes:

a headstock housing;

means supported by the headstock housing for holding a first cylindrical workpiece in a manner that rotation may occur about the axis of the workpiece, said first workpiece being an involute or straight internal or external spline gear;

means connected to the holding means for indexing the first cylindrical workpiece by controllably and auto-

matically rotating it about its axis a preselected rotational distance at each indexing event;

means linked to the holding means for maintaining firmly the orientation of the first workpiece during periods between indexing; and

means connected to the indexing means for powering said indexing means;

a tailstock assembly movably attachable to the support bed which includes:

a tailstock housing;

means supported by the tailstock housing for sustaining a second cylindrical workpiece with its axis colinear with the axis of the first cylindrical workpiece, and in a manner that reciprocating motion along this axis may occur, said second workpiece being a mating match to the involute or straight internal or external spline gear first workpiece whereby the workpieces can be mated for lapping their gears surfaces;

means connected to the sustaining means for moving the sustaining means and second workpiece in a linear, controlled and reciprocating manner along the colinear axis of the mating first workpiece and second workpiece;

means in contact with any of the reciprocating elements for controlling the length of the stroke of the reciprocating motion of the moving means and the second workpiece;

means connected to the headstock assembly and the tailstock assembly for timing and coordinating in a preselected manner the rotation of the first workpiece by the indexing means and the reciprocating motion of the second workpiece by the moving means; and

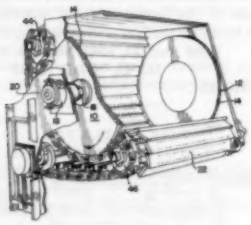
means attached to the controlling means for activating or deactivating the apparatus.

4,476,655

LINK AND FLIGHT ASSEMBLY FOR BLAST TREATMENT APPARATUS

Donald I. Ansbaugh, Granger, Ind., assignor to Wheelabrator-Frye Inc., Mishawaka, Ind.

Filed Aug. 23, 1982, Ser. No. 410,619
Int. Cl.³ B24B *47/02*
U.S. Cl. 51—215 E **4 Claims**



1. A link and flight assembly for a blast cabinet conveyor comprising:

(a) a flight having a first element thereof formed of material which is highly resistant to blast treatment and a backer bar secured behind the flight;

(b) a pair of links including means for interengaging other links to form a conveyor belt of link and flight assemblies and means for securing said links to both ends of said flight only to said backer bar, said securing means including

a mounting plate adapted to be releasably secured to said backer bar;

a mounting arm connecting said plate to said link,

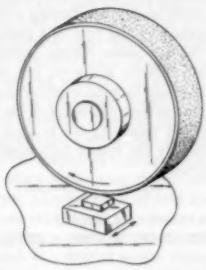
whereby only said first element of the flight need be formed of blast resistant material, the links, backer bar and securing means being formed of lower cost, less blast resistant materials.

4,476,656

METHOD OF DRESSING A PLATED CUBIC BORON NITRIDE GRINDING WHEEL

Harold P. Bovenkerk, Worthington, Ohio, assignor to General Electric Company, Worthington, Ohio

Filed Nov. 18, 1981, Ser. No. 322,346
Int. Cl.³ B24B *1/00*
U.S. Cl. 51—325 **3 Claims**



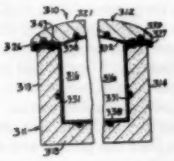
1. A method of dressing a plated grinding wheel made with a single layer of microcrystalline cubic boron nitride grit which method comprises rotating said grinding wheel and lightly grinding a cemented metal carbide with several passes of the grinding wheel before grinding the intended workpiece.

4,476,657

PRECAST CONCRETE STRUCTURAL UNITS AND BURIAL VAULTS

Bernard T. Juba, White Bear Lake, and Michael J. V. Giessen, Blaine, both of Minn., assignors to H. B. Fuller, St. Paul, Minn.

Filed May 22, 1981, Ser. No. 266,369
Int. Cl.³ E04H *13/00*; B32B *13/00*
U.S. Cl. 52—139 **8 Claims**



1. A composite structural unit comprising a plastic resinous sheet, a concrete subunit, and a polychloroprene contact adhesive providing a bond between said sheet and said concrete prepared by a process comprising:

(a) coating said plastic sheet on one side with a latex adhesive, consisting essentially of a blend of an aqueous emulsion of hydrophilic chloroprene copolymer particles and an aqueous emulsion of hydrocarbon tackifier resin particles;

(b) drying said latex adhesive to the touch;

(c) contacting said adhesive with wet, pourable, uncured concrete; and,

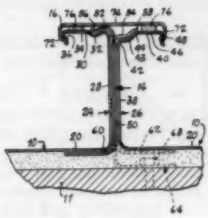
(d) setting and curing said concrete.

4,476,658

STANDING SEAM ROOF SYSTEM

Thomas O. Johnstone, Lancaster, Pa., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Mar. 23, 1981, Ser. No. 246,328
Int. Cl.³ E04C 1/34; E04D 1/34, 1/38
U.S. Cl. 52—395 6 Claims



6. A standing seam roof system comprising, in combination with supporting roof structure,

(a) a plurality of elongated roofing panels each having a central web and first and second longitudinal flanges respectively projecting upwardly therefrom along opposite sides of the panel, with the upper portion of each flange bent inwardly to form a longitudinal leg extending toward the other flange of the panel in vertically spaced parallel relation to the web, said panels being disposed on the roof structure in side-by-side parallel array with the first flange of one panel closely adjacent the second flange of the next panel in the array to constitute therewith a standing seam;

(b) a plurality of anchoring clips fixedly secured to the roof structure in spaced relation to each other along each standing seam, each of said clips including a flat vertical body interposed between the first flange of one panel and the second flange of the next panel at a standing seam, and first and second upper portions respectively projecting in opposite directions from the top of said flat body for respectively overlying and engaging the legs of said last-mentioned first and second flanges, and

(c) for each standing seam, an elongated, resiliently deformable and snap-fittingly mountable cap member of downwardly opening C-shaped cross section snap fitted over the leg of the first flange of one panel and the leg of the second flange of the next panel at that standing seam to cover the gap therebetween, above the upper portions of the anchoring clips at that standing seam;

(d) the leg of each panel flange having an upwardly facing flat portion parallel to the panel web;

(e) a body of sealant material being interposed between each of the cap members and the upwardly facing flat portion of each flange leg over which the cap member is fitted, along the full length of the cap member;

(f) the leg of the first flange of each panel being formed with a longitudinal, upwardly concave groove and the first upper portion of each clip being formed with a downwardly convex bead receivable in said groove; and

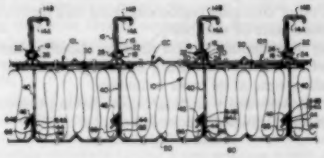
(g) the leg of the second flange of each panel curving inwardly, then upwardly, and then again inwardly to the flat portion thereof, and the second upper portion of said clip curving upwardly to a free longitudinal edge for conformingly overlying the upward curve of the second flange leg of a panel.

4,476,659

INSULATED ROOFING SYSTEM WITH SLIDABLE ROOF TO CEILING CLIPS

Wayne H. Player, Rte. 1, Box 984-A, Mesquite, Tex. 75181

Filed Jun. 22, 1981, Ser. No. 275,656
The portion of the term of this patent subsequent to Feb. 16, 2000, has been disclaimed.
Int. Cl.³ E04B 1/62
U.S. Cl. 52—404 6 Claims



1. A slidable hanger assembly for use in insulatable roofing structures having interlocking elongated roofing panels and interlocking ceiling panels, said roofing and ceiling panels being connectable by multiplicity of slidable hanger assemblies, said slidable hanger assemblies comprising:

a clip rail having means on its top side for attaching to the underside of said interlocking roofing panels;

an elongated clip receiving track on the bottom side of said clip rail; and

an elongated suspension clip having a first end slidably engagable in said track of said clip rail and having a second end connectable to said ceiling panels, which said second end is provided with mobility of the slidable engagement of said first end within said track;

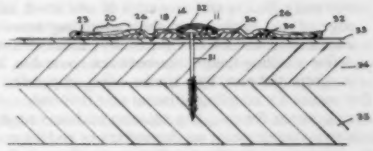
whereby said ceiling panels are suspendable from said roofing panels in a manner that allows the relative misalignment of the roofing panels with respect to the ceiling panels.

4,476,660

MEMBRANE ANCHOR WITH FLEXURE RESISTING REGIONS

Thomas F. Francovitch, 6373 Windharp Way, Columbia, Md. 21045

Filed Sep. 9, 1982, Ser. No. 417,110
Int. Cl.³ E04B 1/62; F16B 29/00; E04D 3/36
U.S. Cl. 52—515 6 Claims



1. In a membrane anchor system in which a roof substrate is covered with a membrane or water impervious material anchored by linear fasteners which penetrate the membrane and are secured to underlying roof structure, a resilient thin disc-like body for engaging said membrane having upper and lower surfaces, said body having an unstressed state and being deformable to a stressed state under load imposed by the linear fastener, and comprising:

(a) a central, substantially planar region,

(b) an opening through said body in said central region for a linear fastener,

(c) means defining a downwardly facing cavity above said membrane outwardly of and surrounding said central region and said opening, said means in part extending

above central region thereby defining in the upper surface a recess above said central region,

(d) means defining a groove in surrounding relationship to said cavity defining means,

(e) an intermediate region extending outwardly of said groove and having an outer boundary, a peripherally extending flexure zone in said body at said outer boundary,

an outer engaging region in surrounding relation to said flexure zone and located at a level below the bottom surface of said groove in the unstressed state of said body, said outer engaging region engaging said membrane in the stressed state of said body,

(g) said intermediate region defining therebeneath a mastic overflow cavity outwardly of said groove, and having a bending zone at its inner boundary.

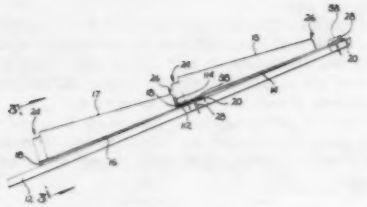
(h) said downwardly sloping region having therein radially extending, upwardly convex regions.

4,476,661

CLIP LOCKED ROOFING AND SIDING PANELS

William J. Hoofe, III, 1973 Port Provence, Newport Beach, Calif. 92660

Filed Dec. 14, 1981, Ser. No. 330,193
Int. Cl.³ E04D *1/34*
U.S. Cl. 52—546 **26 Claims**



1. A roof covering system including a roofing panel having decorative elements, and configured for coupling to similar roofing panels when installed, comprising:

(a) a unitary panel having a background sheet having a front edge, a rear edge, a first side edge and a second side edge;

a decorative element means extending from said background sheet and having first and second ends, said first end adjacent said front edge of said sheet and said second end adjacent said rear edge of said sheet, said rear edge of said background sheet extending rearward of said second end of said decorative element means to define a nailing flange therebetween coverable, at least in substantial part, by a similar adjacent panel;

first means for coupling adjacent said first end;

second means for coupling adjacent said rear edge; and

(b) unitary joining means configured at one end for cooperative engagement with said first means for coupling and configured at its other end for cooperative engagement with said second means for coupling;

whereby said panel may be fastened in place through said nailing flange and coupled, adjacent both its front and rear edges, to similar roofing panels in adjacent courses.

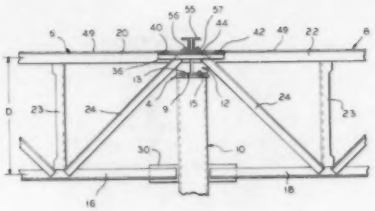
4,476,662

JOIST GIRDER BUILDING CONSTRUCTION

James M. Fisher, 4401 N. Murray Ave., Shorewood, Wis. 53211

Filed Oct. 28, 1981, Ser. No. 315,849
Int. Cl.³ E04B *5/43, 7/00, 1/68*
U.S. Cl. 52—693 **11 Claims**

1. In a joist girder construction including a support element for supporting adjacent ends of joist girders in which each joist girder has an upper chord, a lower chord and vertical and diagonal members interconnecting said upper and lower chords, the improvement to minimize the size of the upper and lower chords of the joist girder for a predetermined load comprising steel tie means connecting the adjacent ends of the upper chords of said joist girders, said tie means including a non-connected zone which affords plastic elongation and deformation of portions of said tie means and said tie means being sized to yield prior to said upper chord yielding and to transfer



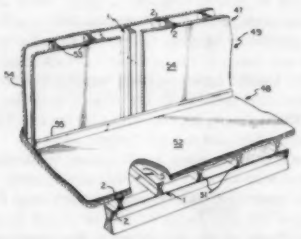
a sufficient horizontal force through said tie means to reduce the chord force said predetermined load causes within said joist girder, including fastening means for connecting said joist girders to said support element, said fastening means retaining said joist girders from separation from said supporting element but not interfering with plastic elongation of said tie means, said fastening means affording relative sliding movement between said support element and said upper chord.

4,476,663

STRUCTURE WITH COMPOSITE MEMBERS

Victor W. Bikales, 7301 Mission Rd., 326A, Shawnee Mission, Kans. 66208

Filed Aug. 15, 1983, Ser. No. 523,372
Int. Cl.³ E04C *3/30*
U.S. Cl. 52—730 **12 Claims**



1. In a structure including a plurality of structural members, the improvement of a composite wood member which comprises:

(a) an aligned pair of elongated pieces, each said piece including:

(1) a narrow face extending longitudinally in relation to said piece and having a transverse width;

(2) a wide face extending longitudinally in relation to said piece and positioned in spaced relation to said narrow face, said wide face having a transverse width greater than said narrow face transverse width;

(3) a pair of radial faces extending between said narrow and wide faces;

(4) a transverse cross-sectional configuration substantially defining a trapezoid with an apex side at said narrow face and a base side at said wide face;

(5) an arcuate, cross-sectional grain pattern concave with respect to said narrow face, said narrow face being

generally in a plane parallel to a tangent of said grain pattern and having a flat grain pattern thereat;

(6) said wide face being generally in a plane parallel to said tangent and having a flat grain pattern thereat; and

(7) each of said radial faces being generally in a respective plane perpendicular to said grain pattern and having a respective vertical grain pattern thereat;

(b) said pieces being bonded together at said narrow faces at a plane of intersection between said wide faces with said wide faces extending substantially parallel to each other; and

(c) said composite member being substantially symmetrical about an axis perpendicular to said wide faces.

4,476,664

APPARATUS FOR INTRODUCING STACKS OF PAPER SHEETS OR THE LIKE INTO CARTONS OR ANALOGOUS RECEPTACLES

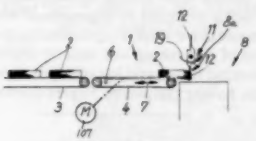
Gerald Kroll; Horst Vogel, and Jürgen Peter, all of Hamburg, Fed. Rep. of Germany, assignors to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Nov. 18, 1981, Ser. No. 322,563

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1980, 3043724

Int. Cl.³ B65B *39/12, 5/06*

U.S. Cl. 53—258 **17 Claims**



1. Apparatus for introducing stacks of paper sheets or the like into cartons or analogous receptacles at a filling station, comprising conveyor means having a stack-supporting surface and being movable along a predetermined path into and from the interior of a receptacle at said station; means for delivering stacks to said conveyor means so that a stack on said conveyor means enters the receptacle at said station when the conveyor means completes its movement into such receptacle; and means for locating stacks on said conveyor means, including an indexible carrier adjacent to said path, at least one pair of stack-engaging elements mounted on said carrier at an angle of substantially 180 degrees relative to each other and movable into and from the path of movement of stacks with and relative to said conveyor means in response to indexing of said carrier, and means for indexing said carrier, one of said elements extending into the path of movement of an oncoming stack during delivery of such stack onto said conveyor means prior to indexing of said carrier in a direction to withdraw such one element from the path of movement of the stack on said surface and before said conveyor means begins to move into the receptacle at said station, the other of said elements extending behind the stack in the receptacle at said station upon completion of introduction of the stack into the receptacle at said station so that said other element prevents the stack from leaving the receptacle during movement of said conveyor means from the receptacle at said station.

4,476,665

PACKAGING MACHINE

Manfred Oberdorf, Gevelsberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Alfred Schmermund GmbH & Co., Gevelsberg, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,912

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046063

Int. Cl.³ B65B *19/24*

U.S. Cl. 53—575 **5 Claims**

1. In apparatus for packaging cigarettes, the apparatus including means for forming individual cigarettes into blocks, the improvement comprising:

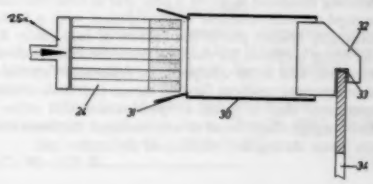
wrapping turntable means, said wrapping turntable means including a turntable having an axis and a plurality of tubular mandrels supported on the turntable and extending generally parallel to said axis of the turntable, each of said mandrels having an insertion end which defines a plane and a cross-sectional size and shape commensurate with a cigarette block to be packaged;

means for imparting rotary stepwise motion to said wrapping turntable means, said motion imparting means causing the rotary position of said turntable means to be incremented in steps equal to the spacing between said mandrels;

a plurality of slide members, one of said slide members extending into each of said wrapping turntable means mandrels from the end opposite to the insertion end thereof, said slide members having a rest position which defines an interior mandrel length substantially equal to the length of the cigarettes being packaged, said slide members being individually axially movable with respect to said mandrels for unloading said mandrels;

means for feeding packaging material to said wrapping turntable means;

means for feeding cigarette blocks into said mandrels through said insertion ends thereof and into contact with said slide members whereby the cigarettes in a mandrel extend from the slide member to the mandrel insertion end



and first ends of the cigarettes will lie generally in said plane of said mandrel insertion end;

means for folding packaging material over the insertion ends of and around individual of said mandrels whereby the folded packaging material will be juxtapositioned to said cigarette first ends;

guide means for determining said rest position of said slide members in and adjacent the ends of said mandrels disposed opposite to said insertion ends during the feeding of cigarette blocks into said mandrels and for maintaining this positioning during the motion of said turntable means between a loading position and an unloading position, said guide means comprising a fixed circular ring which prevents axial movement of said slide members with respect to their respective mandrels, said ring being interrupted at the unloading position of said turntable means;

means for engaging said slide members at the unloading position of said turntable means as determined by the interruption in said guide means ring, said engaging means comprising a reciprocal actuator for imparting axial motion to said slide members to eject the cigarette blocks and the packaging material which has been folded about the mandrels from said turntable means as units, the cigarettes being ejected through said mandrel insertion ends; and

top closing means for closing the tops of the units, said units being transferred to said top closing means by said slide members at the unloading position of said turntable.

4,476,666

MOWING MACHINE

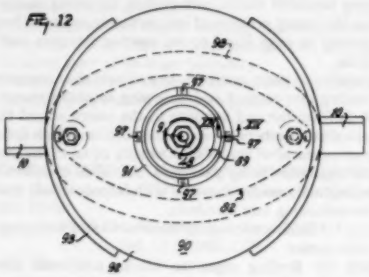
Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. Van der Lely N.V., Maasland, Netherlands

Filed Sep. 8, 1982, Ser. No. 416,047

Claims priority, application Netherlands, Sep. 10, 1981, 8104178

Int. Cl.³ A01D 55/18

U.S. Cl. 56—13.6 11 Claims



1. A mowing maching having an elongated main frame comprising a plurality of driving units with cutters along the length thereof, said cutters being rotatable about respective upwardly extending axes and driving means connected to rotate the cutters about said axes, each driving unit comprising a separable housing for a gear system connected to a common drive shaft for said units, said system including an upwardly extending rotatable shaft on a gear and at least one cutter unit mounted on said rotatable shaft together with a hood that is operatively spaced above the cutters of said cutter unit, said hood being mounted for rotation over the main shaft with said cutter unit, said hood composed of resiliently flexible material and comprising resilient flexible means that is so arranged and constructed that it yields to pass stones and other objects which engage such hood or are received between it and said main frame during the rotation of the cutter unit.

4,476,667

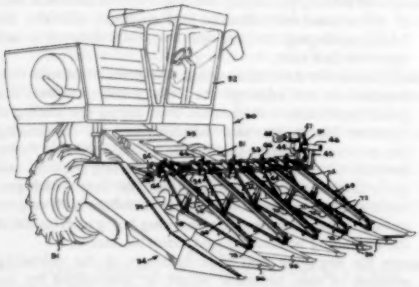
CORN PICKUP ATTACHMENT FOR A COMBINE

Donald Moss, R.R. 1, Tallula, Ill. 62688

Filed Apr. 6, 1983, Ser. No. 482,426

Int. Cl.³ A01D 45/02

U.S. Cl. 56—119 2 Claims



1. In a corn pickup attachment for a combine that includes a wheeled unit embodying a cab, conveyor and a horizontally disposed transverse auger, a plurality of spaced apart, forwardly disposed snouts, a vertically disposed back member, a U-shaped framework including sets of upper parallel brackets affixed to the upper portion of said back member, horizontally disposed support members connected to said brackets, there being a plurality of spaced apart openings in said support members, hollow body pieces telescopically receiving said support members, securing elements extending through certain of the openings in said support members and said body pieces, uprights mounted on one side of the framework, a horizontally disposed support piece on said uprights, a hydraulic motor mounted on said support piece, a horizontally disposed bar mounted on said framework, a plurality of sets of front and rear plates mounted on said bar, securing elements for holding said plates together, a plurality of spaced parallel support elements affixed to said rear plates, greaseless bearings mounted on said support elements, a drive-shaft extending through said bearings, a plurality of spaced apart sprocket members mounted on said drive-shaft, chain and sprocket means operatively connecting said hydraulic motor and said drive-shaft together, each corn pickup attachment including a hollow tubing mounted above each snout, side rails affixed to said tubing providing guide railing, inclined support pieces arranged angularly with respect to said support members, lower brackets affixed to the lower portion of said back member, braces having their lower ends connected to said last named brackets, there being spaced apart openings in said braces, said braces being telescopically received in said support pieces, securing elements extending through said support pieces and through certain of the openings in said braces, endless chains for travel in said guide railing, and said last name endless chains have a plurality of spaced apart fingers thereon, said last named endless chains being arranged in engagement with the sprocket members on said drive-shaft, a leg depending from the intermediate portion of said tubing and secured thereto, and an idler sprocket mounted below said leg and operatively engaging the endless chain having the pickup fingers thereon.

4,476,668

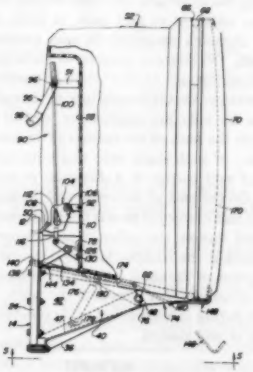
TILT AND DUMP GRASS COLLECTION BOX AND BOX LATCH AND DOOR CLOSURE MECHANISM THEREFOR

Roger D. Reilly, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.

Filed Jul. 8, 1983, Ser. No. 512,097

Int. Cl.³ A01D 35/22, 53/06

U.S. Cl. 56—202 18 Claims



1. A lawn debris collection system, comprising:

a support frame adapted for attachment to the rear of a lawn and garden tractor; said frame including a vertical transverse panel and cantilevered support means extending rearwardly from the panel; a box mounted to said support means for pivotal movement about a horizontal transverse axis between an upright fill position and a rearwardly tilted dump position; said box having a rear wall formed at

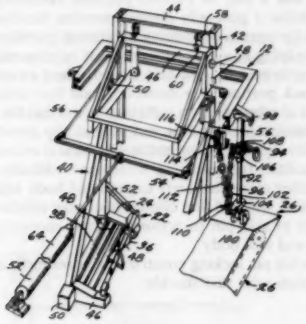
least in part by a door hinged at its top for swinging between closed and open positions in response to the box moving from its fill to its dump position; a latch receptacle carried by said panel; a box latch member yieldably mounted on said box for movement between latched engagement with and disengagement from said receptacle when the box is in its fill position; a door latch means mounted on the box for guided movement between a first position wherein it engages the door and holds it closed and a second position for permitting the door to swing to its open position as the box tilts toward its dump position; a manually operable control lever pivotally mounted on the box for movement between latch and unlatch position; a linkage means mounted on the box and including connection mens coupling the linkage means to the control lever, the box latch member and the door latch means such that as the control lever is moved from its latch towards its unlatch position the door latch member will first move to its second position thereby releasing the door and then the box latch member will be disengaged from the receptacle.

4,476,669

TOBACCO COMBINE WITH SELECTIVE CONVEYOR RAISING

Robert W. Wilson, Charlotte, N.C., assignor to Powell Manufacturing Company, Inc., Bennettsville, S.C.

Filed Oct. 5, 1982, Ser. No. 432,855
Int. Cl.³ A01D *45/16*
U.S. Cl. 56—27.5 **14 Claims**



1. A tobacco combine comprising

a frame operable to be moved along a row of tobacco plants in a tobacco field,

a pair of cooperating power driven mechanical tobacco defoliating units mounted on said frame for (1) movement therewith along the row of tobacco plants on opposite sides of a predetermined vertical extent of the stalks of the tobacco plants for removing tobacco leaves attached to the portion of the stalks within said predetermined vertical extent and (2) vertical movements with respect to said frame within (a) an operative range for varying said predetermined vertical extent of the stalks and (b) above said operating range for clearance purposes,

power operated means for effecting the vertical movements of said defoliator units within said operating range and above,

each of said defoliating units including leaf handling means for directing the removed tobacco leaves laterally away from the row of tobacco plants,

a power driven longitudinal conveyor assembly disposed laterally outwardly from each leaf handling means for receiving leaves directed laterally thereby and moving the same rearwardly,

manually adjustable means extending between said frame and the forward end of each of said longitudinal conveyor assemblies for supporting the same from said frame against downward movement below a selected position of adjustment but permitting upward movement above said selected position of adjustment, and

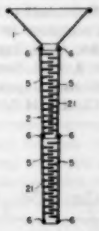
lost motion means operatively connected between said defoliator units and the forward end of each of said longitudinal conveyor assemblies for (1) enabling said power operated means to move said pair of defoliating units vertically within said operating range without effecting any vertical movement of the forward end of either of said longitudinal conveyor assemblies and (2) effecting an upward movement of the forward end of each of said longitudinal conveyor assemblies above the selected position of adjustment thereof in response to the upward movement of said defoliator units by said power operated means upwardly above the predetermined operating range of vertical movements thereof and by so doing to transfer the support of the front end of each of said longitudinal conveyor assemblies from said manually adjustable means to said lost motion means thereby enabling said manually adjustable means to be manually adjusted while out of supporting relation with the forward end of the associated longitudinal conveyor assembly.

4,476,670

SPEED-SLOWING CONVEYING TOOL FOR FRUITS AND THE LIKE

Nobuo Ukai, Yanagawa; Nagahiro Kawano; Yasumasa Toyofuku, both of Kurume, and Akira Nakamura, Ookawa, all of Japan, assignors to Tsukihoshi Kasei Kabushiki Kaisha, Kurume, Japan

Filed Jun. 10, 1983, Ser. No. 502,935
Claims priority, application Japan, Dec. 28, 1982, 57-234196
Int. Cl.³ A01G *19/08*
U.S. Cl. 56—328 R **7 Claims**



1. A speed-slowing conveying tool for lowering fruit or the like from a high place to a lower place without damage thereto, said conveying tool comprising a hopper to be positioned at said high place and tubular conveying means connected at its upper end to the bottom of the hopper and extending downward toward said lower place, the conveying means comprising a pair of opposed and spaced-apart main sheets of rectangular planar shape with vertical edges and a pair of opposed side sheets of rectangular planar shape with vertical edges respectively secured to said vertical edges of the main sheets thereby to form a tubular structure, the main sheets possessing elasticity and flexibility and having on the inner surfaces thereof a large number of distributed elastic projecting members, the side sheets possessing flexibility and being more pliable than the main sheets.

4,476,671

DEVICE FOR THE PARTIAL STRAIGHTENING AND PARALLELIZING OF THE FIBERS OF A THREAD OR THREAD END

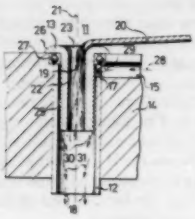
Joachim Rohner, and Heinz Zumfeld, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Oct. 28, 1982, Ser. No. 437,252

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1981, 3143263

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—261 16 Claims



1. Device for the partial straightening and parallelizing of fibers of a thread or thread end in preparation for splicing in a thread splicing apparatus, comprising a turbine being drivable by compressed gas, said turbine including a rotor being accessible from outside said turbine, said rotor having a central opening formed therein being coaxial with the axis of rotation of said rotor for receiving a thread or thread end to be untwisted by rotation of said rotor and withdrawn after untwisting.

4,476,672

AIR NOZZLE FOR FASCIATED YARN SPINNING

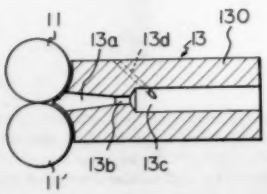
Meiji Asahara; Kazuo Seiki, both of Kariya, and Hiroshi Omori, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Dec. 2, 1982, Ser. No. 446,381

Claims priority, application Japan, Dec. 15, 1981, 56-200896

Int. Cl.³ D01H *1/13, 7/898*

U.S. Cl. 57—333 6 Claims



1. An air nozzle utilized for fasciated yarn spinning and disposed downstream of a pair of draft rollers, comprising an inlet and a fiber passage in series, said fiber passage being provided with at least one jet forwardly inclined to and deviated from the axis of said fiber passage, said inlet having an opening of a substantially flattened shape along the rotational axes of said draft rollers, with the cross-sectional size of said inlet gradually decreasing both in height and width toward said fiber passage.

4,476,673

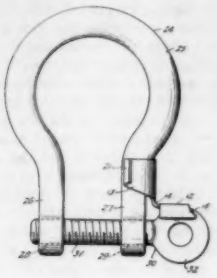
SHACKLE PIN LOCKING CONSTRUCTION

Ronald T. Brown, 102 Bruno Ave., Pittsburg, Calif. 94565

Filed Mar. 11, 1983, Ser. No. 474,507

Int. Cl.³ F16G *13/06*

U.S. Cl. 59—86 4 Claims



1. A shackle pin locking construction for use with a shackle of a type including a generally U-shaped main body having a pair of free ends, there being an aligned bore in each of said free ends and a pin selectively engaging said bores to span an opening between said free ends, said locking construction including: a unitary body defining first and second clip members, said first clip member having a generally planar central portion and a pair of parallel portions extending therefrom which define a generally planar interstice therebetween; said second clip member including an arcuate portion defining an interstice lying in a generally coplanar relation relative to the interstice formed by said first clip member; an angularly disposed neck portion interconnecting said first and second clip members at substantially a right angle such that the openings to said interstices in said first and second clip members face in mutual diverging relation; and means on said second clip member to facilitate the spreading of the same; whereby said second clip member may selectively engage said body adjacent a free end thereof, and said first clip member may selectively engage a portion of said pin to prevent relative movement between said pin and said body.

2. Shackle pin locking construction as set forth in claim 1, in combination with said shackle.

4,476,674

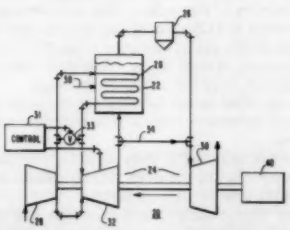
POWER GENERATING PLANT EMPLOYING A REHEAT PRESSURIZED FLUIDIZED BED COMBUSTOR SYSTEM

Paul A. Berman, Plymouth Meeting, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 10, 1982, Ser. No. 387,296

Int. Cl.³ F02C *6/18*

U.S. Cl. 60—39.182 10 Claims



1. A reheat pressurized fluidized bed combustor system for a power plant comprising a compressor for pressurizing rela-

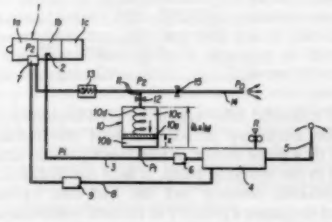
tively clean source air to a predetermined elevated value, a high pressure gas turbine, a combustor unit having a sorbent bed and fuel supply means, heat exchanger tube means disposed in heat exchange relation with said combustor bed, means for directing compressor outlet air to said heat exchanger tube means, means for directing heated outlet air from said heat exchanger tube means to provide the complete driving gas flow to the high pressure turbine inlet to drive said high pressure turbine, means for directing at least a part of the pressurized exhaust air to said combustor unit to be reheated and to fluidize said bed and support fuel combustion therein, means for cleaning the preheated combustor outlet gas to provide hot turbine parts protection against degradation otherwise due to carryover from said combustor unit, a low pressure turbine, means for generating electric power, means for coupling said high and low pressure turbines in a predetermined arrangement to drive said generating means and said compressor, means for directing the cleaned and reheated gas to the low pressure turbine inlet to drive said low pressure turbine, and means for controlling at least one predetermined variable to control the operating level of said combustor system.

4,476,675

ACCELERATION LIMITER FOR TURBOJET ENGINE

Christian Aurousseau, Dammarie les Lys, and Pierre P. L. Odeyer, Paris, both of France, assignors to S.N.E.C.M.A., Paris, France

Filed Mar. 8, 1982, Ser. No. 355,662
Claims priority, application France, Mar. 6, 1981, 81 04464
Int. Cl.³ F02C *9/28*
U.S. Cl. 60—39.281 **1 Claim**



1. An acceleration limiter for turbojets, having at least one hydraulic accumulator connected to the supply circuit of the fuel injectors, said accumulator comprising:

a piston which divides the cylinder of said accumulator into a first chamber which is connected to a point in said supply circuit of said injectors said point being located just upstream from said injectors and a second chamber connected to the outlet of the compressor of said turbojet by a tube which includes an adjustable diaphragm,

an elastic means acting on said piston in a direction tending to reduce the volume of said first chamber, and

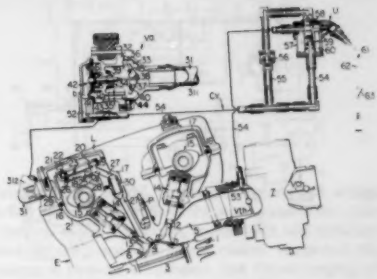
a check-valve inserted between said second chamber of said accumulator and the outlet of said compressor wherein said tube connecting said second chamber of said accumulator to the outlet of said compressor has at a point located between said check-valve and said adjustable diaphragm an off-take which communicates with the atmosphere through a second diaphragm.

4,476,676

SECONDARY AIR SUPPLY CONTROL DEVICE FOR EXHAUST GAS PURIFYING APPARATUS OF INTERNAL COMBUSTION ENGINES

Yasuo Ikenoya, Kawagoe, and Yoichi Ishida, Niiza, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1982, Ser. No. 397,927
Claims priority, application Japan, Jul. 15, 1981, 56-110573
Int. Cl.³ F02B *75/10*; F01N *3/22*
U.S. Cl. 60—290 **6 Claims**



1. In an apparatus for purifying exhaust gas of an internal combustion engine, in which a secondary air supply system, is made to communicate with an exhaust system of the internal combustion engine so that secondary air may be supplied during running operation of the internal combustion engine to said exhaust system thereby to oxidize the unburned noxious content in said exhaust system, a secondary air supply control device comprising:

a vacuum-operated secondary air control valve disposed midway of said secondary air supply system for controlling the flow rate of secondary air to be supplied to said exhaust system,

control means for controlling said vacuum-operated secondary air control valve by intake vacuum during deceleration and choking operation at the time of starting of said engine so that supply of the secondary air to said exhaust system is interrupted, said control means including a main vacuum circuit for producing communication between said secondary air control valve and the intake system of said internal combustion engine, an auxiliary vacuum circuit bypassing said main vacuum circuit; and

a change-over valve interposed between said main vacuum circuit and said auxiliary vacuum circuit for interchangeably opening and closing said main and auxiliary vacuum circuits in response to an operative condition of the engine including deceleration and the choking operation.

4,476,677

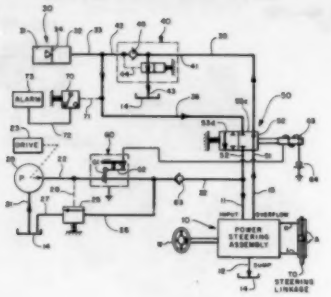
HYDRAULIC SUPPLY CIRCUIT FOR VEHICLE STEERING SYSTEM

Richard D. Hanshaw, Peoria, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 25, 1982, Ser. No. 411,447
Int. Cl.³ B62D *5/08*; F15B *20/00*
U.S. Cl. 60—328 **4 Claims**

1. In an hydraulic supply circuit for a vehicle power steering system of the type having a steering actuator and control valve therefor with hydraulic input, sump and overflow connections and in which any pressurized fluid not consumed by the actuator is diverted to the overflow connection, the combination comprising a positive displacement pump having a sump connection and an output line, a drive therefor, the output line being connected to the input connection of the steering system, a gas/oil accumulator having a charging line and a discharging

line, an unloading valve in the charging line for diverting fluid from the charging line to the sump when the accumulator has been charged to maximum rated pressure, a charge-discharge valve having charge and discharge passages alternatively open in respective charge and discharge modes but otherwise closed, the charge passage being interposed between the overflow connection and the accumulator charging line so that in the charge mode the accumulator is charged by the overflow, the discharge passage being interposed between the accumulator discharge line and the input connection of the steering system so that in the discharge mode pressurized fluid is supplied from the accumulator to the input connection for maintaining the steering system in operation while the overflow connection is blocked, and means including a flow sensing device in the output line of the pump for maintaining the charge-discharge valve in its charge mode as long as fluid is pumped at normal rate by the pump but for causing the charge-discharge valve to switch to its discharge mode for emergency steering upon interruption of the flow.



4,476,678

CONTROL MECHANISM FOR PNEUMATIC APPARATUS

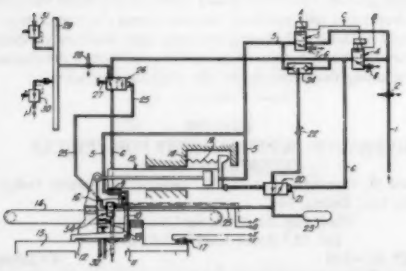
John L. Hall, Maidenhead, England, assignor to PLC Peters Limited, Middlesex, England

Filed Jan. 28, 1981, Ser. No. 229,149

Claims priority, application United Kingdom, Jan. 31, 1980, 8003238

Int. Cl.³ F15B *15/00, 15/26*; F16K *31/122*

U.S. Cl. 60—404 **22 Claims**



1. A control mechanism for pneumatic apparatus having a piston-and-cylinder motor coupled between two relatively-movable parts, said motor having an actuating chamber, and means for supplying high-pressure air to the actuating chamber to drive the said parts to a predetermined relative position, the control mechanism comprising a pilot valve coupled between said supply means and said actuating chamber and allowing flow of high-pressure air to said actuating chamber in a normal mode of operation, an emergency reservoir having a volume large compared with the maximum volume of gas in the motor, means for actuating said pilot valve to an emergency mode in which it isolates the actuating chamber from said supply means and connects it to the emergency reservoir, whereby the pressure in the actuating chamber falls to a value such that the relatively-movable parts are urged towards the predetermined relative position by a lower force which can be overcome when the parts are moved by external means, said mechanism having a source of gas under pressure, a timing reservoir normally charged with gas under pressure from said source through a constricted passage to maintain therein a pressure connected to said pilot valve to hold the pilot valve against a biasing force in its non-actuated position, and a detector valve, being engaged and moved by the motor upon detection of an obstruction to movement of the motor to discharge the timing reservoir to move the relatively movable parts to a predetermined relative position.

4,476,679

CIVIL ENGINEERING AND CONSTRUCTION MACHINERY WITH HYDRAULIC DRIVE SYSTEM

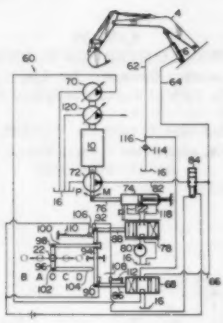
Masayuki Sato, Tsuchiura, Japan, assignor to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1981, Ser. No. 234,177

Claims priority, application Japan, Feb. 15, 1980, 55-16635

Int. Cl.³ F16D *31/02*

U.S. Cl. 60—434 **5 Claims**



1. A hydraulic drive system for civil engineering and construction machinery including at least one hydraulic pump driven by a prime mover, at least one hydraulic actuator connected to the hydraulic pump, at least one hydraulic cylinder, the hydraulic actuator and the hydraulic cylinder being adapted to operate a plurality of movable members, and at least one other hydraulic pump driven by the prime mover and connected to the hydraulic cylinder through a directional control valve to operate an associated movable member, characterized in that the hydraulic drive system comprises:

a hydraulic pump-motor driven by the primer mover;

first conduit means for connecting the hydraulic pump-motor to one side of the hydraulic cylinder which moves a movable member in a direction in which a potential energy of the movable member increases in magnitude upon feeding of a pressure medium under pressure thereinto;

second conduit means for connecting a second side of the hydraulic cylinder to a reservoir; and

means for controlling the hydraulic pump-motor in such a manner that it functions as a motor driven by the hydraulic cylinder only when the operator operates the hydraulic drive system to move the movable member in a direction in which the potential energy thereof is reduced in magnitude, whereby the potential energy of the movable mem-

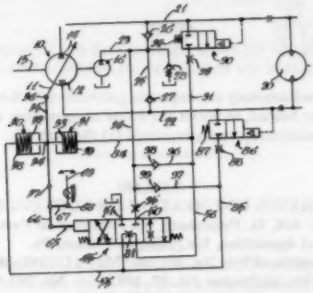
ber is utilized to drive the prime mover and thus said hydraulic pumps, through said hydraulic pump-motor functioning as a motor.

4,476,680

PRESSURE OVERRIDE CONTROL

Frederic W. Pollman, and Stanley W. Crull, both of Ames, Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 14, 1979, Ser. No. 66,499
Int. Cl.³ F04B *49/08*; F16H *39/46*
U.S. Cl. 60—444 **15 Claims**



8. A pressure override control for a hydrostatic transmission having a variable displacement pump in circuit with a motor by means of two fluid lines, a charge pump for supplying oil to said circuit and for supplying control oil at a control pressure, a displacement control for said pump including a pair of servo motors arranged to act in opposition to each other and a displacement control valve having control pressure and drain connections and connected to said servo motors for selectively-applying control pressure to one or the other of said servo motors and connecting the other servo motor to drain comprising, a pair of branch fluid lines connected to said displacement control valve and one to each of said fluid lines and one to each of said servo motors, a pair of pressure relief valves connected one in each of said branch lines and being openable in response to system pressure in the associated fluid line of said circuit exceeding a predetermined value for directing oil from the circuit to the associated servo motor, said displacement control valve having a first position for maintaining said pump in stroke at a desired displacement and having a second neutral position, said displacement control valve having means to block fluid communication between said servo motors in said first position and means to place said servo motors in communication in said neutral position but out of communication with the control pressure and drain connections.

4,476,681

BALANCE FREE-PISTON HYDRAULIC PUMP

John J. Dineen, deceased, late of Durham, N.H. (by Gertrude D. Dineen, administratrix), assignor to Mechanical Technology Incorporated, Latham, N.Y.

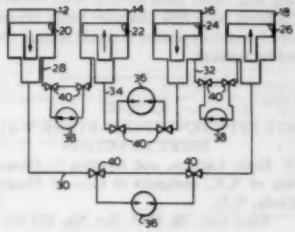
Filed Mar. 2, 1982, Ser. No. 354,019
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—486 **4 Claims**

1. A hydraulic pump for use in association with a four cylinder free-piston Stirling engine to provide a power output thereto, said pump comprising:

at least four displaceable pump pistons disposed in respective cylinders and symmetrically arranged so as to maintain pump balance;

synchronizing means which includes hydraulic connection means between the respective pump piston cylinders whereby hydraulic fluid is pumped through said connecting means due to displacement of the pump pistons in their cylinders which can be tapped as a source of hydraulic power, while providing that the pump pistons operate in pairs that are displaced 180° out of phase of each other; and

said pump pistons and cylinders are formed so as to provide a low flow/high pressure situation at one point in the



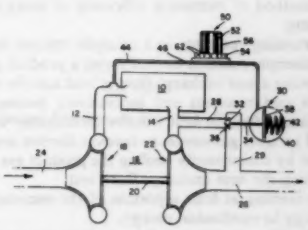
cylinder coupled to the connecting means and a high flow/low pressure situation at the other point in the cylinder coupled to the connecting means with said situations created by the respective pump pistons reciprocal displacement in respective cylinders, and allows tapping off of either situation as a source of hydraulic power.

4,476,682

TURBOCHARGED INTERNAL COMBUSTION ENGINE HAVING AN ALTITUDE COMPENSATED BOOST CONTROL AND METHOD FOR ITS OPERATION

Charles E. McInerney, Rolling Hills Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jan. 26, 1982, Ser. No. 342,983
Int. Cl.³ F02B *37/12*; F02D *23/00*
U.S. Cl. 60—602 **12 Claims**



11. A turbocharger for an internal combustion engine having an inlet manifold and an exhaust manifold, said turborcharger comprising:

a compressor housing having an inlet opening and an outlet opening, said outlet opening being connected to the inlet manifold of said engine for supplying charger air to said engine;

a turbine housing having an inlet opening and a outlet opening and a chamber intermediate said inlet and said outlet openings forming a bypass conduit therebetween, the inlet opening of said turbine housing being connected to the exhaust manifold of said engine for receiving exhaust gases therefrom;

a compressor wheel mounted on said shaft in said compressor housing between said compressor and outlet openings;

a turbine wheel mounted on said shaft in said turbine housing between said turbine inlet opening and said turbine outlet openings;

valve means slidably mounted in an opening in said turbine housing, said valve means having a head portion and a

stem portion, said head portion forming selective sealing means for said bypass conduit; and

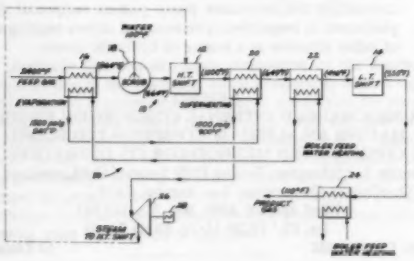
an altitude compensating bypass control means including a source of control fluid, an altitude compensating bleed valve for varying the pressure of said control fluid, and an actuator means having a flexible wall means separating said actuator means into a first and a second chamber, said wall means attached to said valve means for selectively moving said valve head portion with respect to said bypass conduit, said first chamber being connected to said source of control pressure and said second chamber being vented to ambient.

4,476,683

ENERGY EFFICIENT MULTI-STAGE WATER GAS SHIFT REACTION

Rasiklal P. Shah, Latham, and Cynthia L. Gleason, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,363
Int. Cl.³ F01K *17/00*
U.S. Cl. 60—648 **17 Claims**



1. A method of increasing efficiency of energy utilization comprising:

(a) furnishing reactants to a catalytic reactor such that an exothermic reaction thereof forms a product gas stream;

(b) passing a heat exchange fluid in heat transfer relationship with said reactants and successively passing said heat exchange fluid in heat transfer relationship with at least said product gas stream to recover thermal energy therefrom by concurrently cooling the product gas stream and heating the heat exchange fluid; and

(c) converting at least a portion of the recovered thermal energy to mechanical energy,

wherein the temperature of the product gas stream is above the pinch point of the heat exchange fluid and the exothermic reaction is chosen from the group consisting of methanation, ammonia synthesis and catalytic oxidation.

4,476,684

HOT BED POWER

John R. Phillips, 911 Maryhurst Dr., Claremont, Calif. 91711

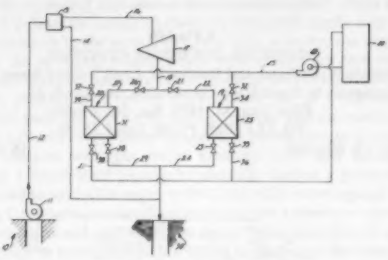
Continuation-in-part of Ser. No. 442,585, Nov. 18, 1982, abandoned. This application Mar. 18, 1983, Ser. No. 476,825
Int. Cl.³ F01K *9/00*
U.S. Cl. 60—689 **20 Claims**

1. A process for removing heat from the exhaust of a heat engine comprising:

(a) contacting exhaust vapor of a heat engine with solid particles at an initial temperature which is cooler than the temperature of the exhaust vapor for a time sufficient to cool the exhaust vapor and to heat the solid particles;

(b) simultaneously cooling other solid particles to about the initial temperature; followed by

(c) contacting exhaust vapor with solid particles previously cooled to about the initial temperature for a time sufficient to cool the exhaust vapor and to heat the solid particles;



(d) simultaneously cooling solid particles, which were previously heated, to about the initial temperature; and then

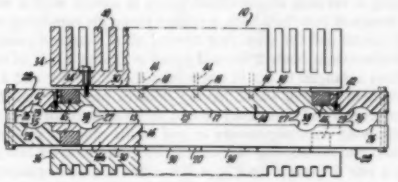
(e) continuously repeating steps (a) through (d).

4,476,685

APPARATUS FOR HEATING OR COOLING FLUIDS

James D. Aid, St. Petersburg, Fla., assignor to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Continuation of Ser. No. 262,162, May 11, 1981, abandoned. This application Jul. 12, 1982, Ser. No. 397,310
Int. Cl.³ F25B *21/02*
U.S. Cl. 62—3 **19 Claims**



1. Apparatus for heating or cooling a liquid, said apparatus comprising a pair of thermally conductive elements, each of said elements having first and second thermally conductive major surfaces, said elements being arranged in spaced apart relationship with their respective first major surfaces facing each other so as to define a space therebetween, the second thermally conductive major surfaces of each of said elements having in heat conductive contact therewith at least one thermoelectric device for heating or cooling, each of said thermoelectric devices being in contact with a heat sink means, and, removably disposed in said space, a flexible container means in which or through which a liquid to be heated or cooled may be contained or circulated.

4,476,686

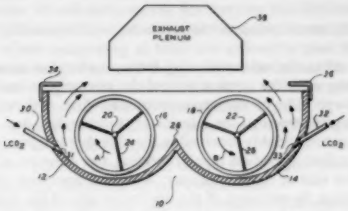
METHODS AND APPARATUS FOR CHILLING A PRODUCT

Scott T. Madsen, Burr Ridge, and Ralph E. Johanson, Lombard, both of Ill., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Sep. 29, 1982, Ser. No. 426,314
Int. Cl.³ F25D *3/12*
U.S. Cl. 62—63 **12 Claims**

11. The method of chilling a product in a blender device comprising the steps of introducing said product into a trough of the blender; introducing liquid CO_2 into the product at a location below the surface of the product to form solid and gaseous CO_2 in the trough; mixing said product with said CO_2 by passing said product countercurrent to the direction in which said CO_2 is injected into said trough to chill said product

with a major portion of said gaseous CO_2 rising substantially along one wall of said trough; and deflecting said major portion of gaseous CO_2 as the same rises above the trough toward an exhaust device located above the open top of said trough.



4,476,687

COOLING HEATED METAL SURFACES

Michael T. Conklin, South New Berlin, and Charles F. Mowry, Rome, both of N.Y., assignors to Fire Out Enterprises Company, Inc., South New Berlin, N.Y.

Continuation of Ser. No. 382,558, May 27, 1982, abandoned. This application Mar. 5, 1984, Ser. No. 585,616

Int. Cl.³ F25D *17/02*

U.S. Cl. 62—64 **19 Claims**

1. The process of rapidly cooling heated surfaces comprising,

preparing a concentrate consisting essentially of one or more nonionic surfactants having a cloud point of 68° F.–212° F. and sufficient water to form not greater than 30% by weight of a concentrate solution of said surfactant,

mixing said concentrate with water to form a solution of said surfactant not greater than 0.2% by volume of said surfactant,

applying said solution on a heated surface and simultaneously cooling said surface at a rapid rate.

4,476,688

REFRIGERANT RECOVERY AND PURIFICATION SYSTEM

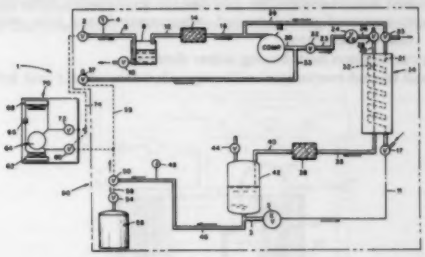
Lawrence A. Goddard, P.O. Box 18822, Tampa, Fla. 33679

Filed Feb. 18, 1983, Ser. No. 454,424

Int. Cl.³ F25B *49/00*

U.S. Cl. 62—149 **5 Claims**

1. A refrigerant recovery and purification system for removing gaseous refrigerant from a disabled refrigeration unit, cleansing the refrigerant of contaminants, and converting the gaseous refrigerant to a liquid state for storage or subsequent return to the refrigeration unit upon repair thereof, said system comprising a compressor, first conduit means for coupling the compressor to a refrigerant line in the refrigeration unit, trap means in the first conduit means for removing oil and impurities from the gaseous refrigerant prior to reception thereof in the compressor, condensing means coupled to the compressor by second conduit means for receiving compressed refrigerant emanating from the compressor, evaporating means disposed in heat exchange relationship with said condensing means for effecting the conversion of the compressed refrigerant to a liquid state, third conduit means for conveying a gaseous fluid through said evaporating means with said fluid being at a temperature adequate for effecting said conversion with said third conduit means being coupled to said reservoir for receiving liquid refrigerant therefrom, expansion means disposed in said third conduit means for converting the liquid refrigerant



therein to a gaseous state for providing the gaseous fluid conveyed through the evaporating means, reservoir means coupled to said condensing means by fourth conduit means for receiving the liquid refrigerant from the condensing means, filter and drying means disposed in said fourth conduit means for removing acid, moisture, foreign particles and the like, fifth conduit means coupled to said reservoir for conveying liquid refrigerant to a point of utilization, and sixth conduit means coupled to said evaporating means and said first conduit means for conveying the gaseous fluid from the evaporating means to the compressor.

4,476,689

Patent Not Issued For This Number

4,476,690

DUAL TEMPERATURE REFRIGERATION SYSTEM

Frank M. Iannelli, 5215 Pogue St., Spartanburg, S.C. 29301

Filed Jul. 29, 1982, Ser. No. 403,142

Int. Cl.³ F25B *49/00*

U.S. Cl. 62—198 **2 Claims**

1. A dual temperature refrigeration system comprising:

a compressor unit supplying a flow of refrigerant;

a first evaporator coil having an input end connected to said compressor for receiving refrigerant therefrom;

a capillary tube connected between said compressor and said first evaporator coil for causing said refrigerant flowing through said first evaporator coil to reduce the temperature of said first evaporator coil and the surrounding medium to a first predetermined temperature;

a return conduit extending to said compressor unit;

a restrictor tube having one end connected to the output end of said first evaporator coil;

a second evaporator coil connected between the other end of said restrictor tube and said return conduit;

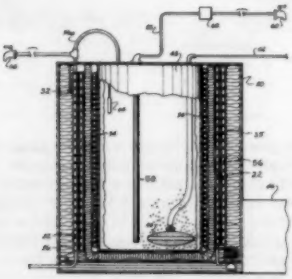
a by-pass conduit extending between said output end of said first evaporator coil and said return conduit;

switch means provided in said by-pass conduit for selectively opening and closing said by-pass conduit for directing the main flow of refrigerant from said first evaporator coil either through said by-pass conduit or said restrictor tube and said second evaporator coil;

said restrictor tube causing said refrigerant flowing through said second evaporator coil to reduce the temperature of said second evaporator coil and the surrounding medium to a second predetermined temperature lower than said first temperature;

a carbonation tank having water therein;

said second evaporator coil being coiled around said tank for



producing an ice bank in said tank when refrigerant is permitted to flow through said second evaporator coil;

a liquid dispensing coil carried in heat transfer relation with said first evaporator coil having one end connected to a source of water and the other end terminating in said carbonation tank so that water flowing through said liquid dispensing coil is chilled by said first evaporator coil prior to said water entering said carbonation tank wherein the temperature of said chilled water is reduced even further for enhancing carbonation;

a first thermostat carried adjacent said liquid dispensing coil for energizing and opening said switch means when said temperature of said liquid coil rises above a predetermined level; and

a second thermostat carried in said water in said tank for energizing said compressor unit when said water rises above a predetermined temperature.

4,476,691

REFRIGERATION CYCLE APPARATUS

Masao Ozu, Fuji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 27, 1983, Ser. No. 498,785

Claims priority, application Japan, Jun. 4, 1982, 57-96040

Int. Cl.³ F25B *41/04*

U.S. Cl. 62—217 **10 Claims**

1. A refrigeration cycle apparatus which comprises:

a compressor;

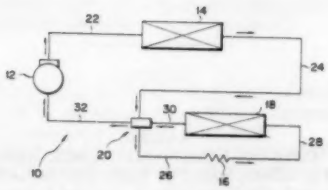
a condenser connected to the discharge side of the compressor;

an evaporator connected to the suction side of the compressor;

a decompressor connected between the condenser and evaporator; and

a valve which includes a housing having a chamber communicating with the suction side of the compressor and the discharge side of the evaporator and first and second guide ports open to the interior of the chamber, and

a valve piston slidably received in the chamber and provided with a first operation plane receiving the pressure of the suction side of the compressor, a second operation plane receiving the pressure of the discharge side of the evaporator, a first communication passage for effecting communication between the suction side of the compressor and the discharge side of the evaporator and a second commu-



nication passage for effecting communication between the first and second guide ports, the valve, when the suction side of the compressor has a lower pressure than the discharge side of the evaporator, sliding to a first position in which the suction side of the compressor communicates with the discharge side of the evaporator through the first communication passage and the first guide port communicates with the second guide port through the second communication passage; and the valve, when the suction side of the compressor has a higher pressure than the discharge side of the evaporator, sliding to a second position in which communication between the suction side of the compressor and the discharge side of the evaporator as well as between the first and second guide ports are shut off; and wherein the first and second guide ports are connected between the discharge side of the compressor and the suction side of the evaporator.

4,476,692

AUTOMOTIVE REFRIGERATION SYSTEM

Yasuyuki Nishi, Oobu; Masasi Takagi, Kariya, and Masao Sakurai, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 16, 1982, Ser. No. 398,882

Claims priority, application Japan, Jul. 17, 1981, 56-112427

Int. Cl.³ F25B *1/00*

U.S. Cl. 62—228.5 **8 Claims**

1. An automotive refrigeration system comprising:

a variable capacity vane-type refrigerant compressor including an intake chamber and a discharge chamber;

electromagnetic clutch means for drivingly connecting and disconnecting said compressor to and from an automotive engine;

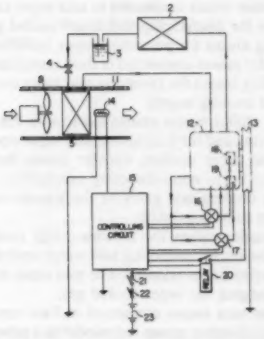
means, in said compressor, for varying the displacement of said compressor, said compressor displacement varying means comprising at least one unloading port formed in said compressor and being adapted to release the refrigerant being compressed therein and a valve member operatively associated with said unloading port;

a refrigerant evaporator disposed in fluid-flow communcation with said compressor;

sensor means operative to detect a condition related to the cooling operation of said evaporator;

means for controlling said compressor displacement varying means; and

electric circuit means operative in response to a signal from said sensor means to actuate said control means for



thereby varying the displacement of said compressor and to control the operation of said electromagnetic clutch means to thereby provide a multi-stage compressor displacement control,

wherein said controlling means comprises a pressure responsive actuator operatively connected to said valve member and a solenoid valve means adapted to be actuated by said electric circuit means to control the application of a pressure to said pressure responsive actuator,

wherein said solenoid valve means is provided with a first port pneumatically connected to said pressure responsive actuator and third and fourth ports pneumatically responsive to said compressor intake and discharge chambers, respectively, said solenoid valve means including a solenoid-operated valve member movable to selectively communicate said first port with said first and third ports.

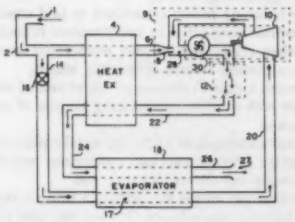
4,476,693

THERMAL ENERGY ACCUMULATION

Lonnie G. Johnson, 2923 N. Casitas Ave., Altadena, Calif. 91001

Filed Mar. 14, 1980, Ser. No. 130,417
Int. Cl.³ F25D *9/00*
U.S. Cl. 62—402 **6 Claims**

1. In combination with a pressurized fluid source supplying fluid flow to a controlled volume for flow therethrough, thermal energy accumulation means wherein a heat exchanger means and a heat engine means operate in combination to transfer an amount of thermal energy from fluid flowing from said controlled volume to fluid flowing to said controlled volume sufficient to effect the accumulation of thermal energy inside said controlled volume and thereby cause said fluid to flow therethrough at an elevated temperature, said heat engine means deriving operating power from said pressurized fluid flow and utilizing said fluid as a working fluid in said heat engine means and causing said fluid to undergo thermodynamic phase changes to effect heat transfer, said heat exchanger means being coupled to said pressurized fluid source and to said controlled volume and effecting an initial transfer of heat from fluid flowing from said controlled volume to fluid



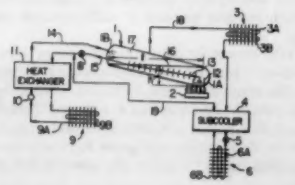
being supplied to said controlled volume, said heat engine means being coupled to said heat exchanger means and to said controlled volume to effect a final transfer of heat from fluid flowing from said controlled volume to fluid being supplied to said controlled volume by transferring heat to fluid heated in said heat exchanger means and flowing therefrom from fluid cooled in said heat exchanger means and flowing therefrom, said controlled volume receiving heated fluid from said heat engine means, said pressurized fluid from said source flowing through said heat exchanger means in a pressurized state to said heat engine means, said pressurized fluid supplying operating power to said heat engine means by mechanically actuating said heat engine means and thereby experiencing a pressure decrease.

4,476,694

ABSORPTION COOLING AND HEATING SYSTEM

Yoshifumi Kunugi, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 20, 1983, Ser. No. 459,662
Claims priority, application Japan, Jan. 22, 1982, 57-7578
Int. Cl.³ F25B *15/00*
U.S. Cl. 62—476 **10 Claims**



1. An absorption cooling and heating system comprising:

generating means including a heating source means for heat-

ing a solution to cause a refrigerant contained in the solution to evaporate into a refrigerant in a gaseous state and at the same time produce a poor solution of low refrigerant content, a container of a shape in which a liquid level of a solution contained therein has a horizontal length greater than a maximum depth of said solution, a poor solution passage provided in an interior of said container and extending through the solution, said poor solution passage having a poor solution take-out port opening at one end of said container, a rich solution introducing section opening at the other end of said container for introducing a rich solution of high refrigerant content into said container, and a refrigerant gas take-out port for the refrigerant in a gaseous state obtained by generation from the solution;

a condenser connected to said refrigerant gas take-out port of said generating means;

pressure reducing means connected to said condenser;

an evaporator connected to said pressure reducing means;

an absorber connected to said evaporator and said poor soultion passage in said generating means;

pump means located between an outlet end of said absorber and the rich solution introducing section of said generating means;

a subcooler causing heat exchange to take place between the refrigerant flowing into said evaporator and the refrigerant flowing out the evaporator; and

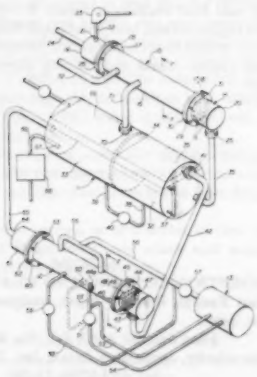
a heat exchanger means for causing a heat exchange to take place between the solution flowing into said absorber and the solution flowing out of said absorber.

4,476,695

REFRIGERATOR CONDENSATION APPARATUS

Tim Epps, P.O. Box 1416, Pampa, Tex. 79065

Filed Dec. 15, 1983, Ser. No. 561,688
Int. Cl.³ F25B *43/00*
U.S. Cl. 62—512 **8 Claims**



1. An apparatus using refrigeration for separating gases which liquify and separate at reduced temperatures from natural gas which remains gaseous at such reduced temperatures comprising;

(a) a 1st inlet means for delivering said gases to be separated;

(b) a pre-cool transfer means connected to said 1st inlet means for transfering heat from said gases to be separated as said gases to be separated are passed therethrough;

(c) a 1st outlet means connected to said pre-cool transfer means for discharging said gases to be separated;

(d) a 2nd inlet means for delivering gases at reduced temperatures;

(e) a flow way means connected to said 2nd inlet means for receiving said gases at reduced temperature and positioned about said pre-cool transfer means for said gases at reduced temperature to be in noncontacting conductive relationship for the transfer of heat from said gases to be separated in said pre-cool transfer means;

(f) a 2nd outlet means connected to said flow way means for discharging said gases;

(g) a chamber means connected in fluid communication with said 1st outlet means for providing a condensing zone for condensation of water and other gases which condense after the transfer of heat from said gases to be separated in said pre-cool transfer means;

(h) a 3rd outlet means connected to said chamber means for discharging said gases to be separated;

(i) a 1st discharge port means connected to said chamber means at a low point therein for removing condensed liquids from the chamber means;

(j) a super coolant transfer means connected in fluid communication with said 3rd outlet means for receiving said gases from said chamber means and for super cooling said gases while therein;

(k) a 4th outlet means connected to said super coolant transfer means for discharging said super cooled gases;

(l) a cooling means for providing super cooled coolant;

(m) a 5th inlet means connected in fluid communication with said cooling means for receiving said super cooled coolant from said cooling means;

(n) a super chiller means connected to said 5th inlet means for receiving and for positioning said super cooled coolant about said super coolant transfer means for said super coolant to be in non-contacting conductive relationship for super cooling said gases by the transfer of heat from said gases to be separated;

(o) a 6th outlet means for returning said coolant to said cooling means for recooling said super cooled coolant;

(p) a 5th outlet means connected to said super chiller means for discharging the super cooled gas;

(q) a process tank means connected in fluid communication with said 5th outlet means for providing a process zone for the condensation of any remaining liquids from said gases at the reduced temperature;

(r) a 7th outlet means connected to said process tank means for delivering said gases at reduced temperature to said 2nd inlet means; and

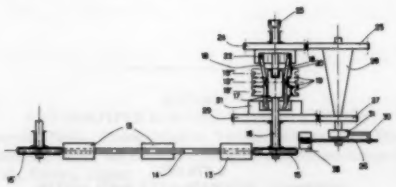
(s) a 2nd discharge port means connected to said process tank means at a low point therein for removing the liquids from said process tank means.

4,476,696

HOME KNITTING MACHINE

Alfred Gloeckler, Riedisheim, France, assignor to Superba S.A., Mulhous, France

Filed Apr. 5, 1979, Ser. No. 27,375
Claims priority, application France, Apr. 27, 1978, 78 12587
Int. Cl.³ D04B *7/00, 15/66*
U.S. Cl. 66—75.2 **13 Claims**



1. A home knitting machine comprising at least one straight needle bed member, knitting needles received in said needle bed member, a carriage movable on said needle bed member for actuating and displacing the needles of said needle bed member, a programming installation comprising reading means

which are electrically connected to said carriage for relative movement with respect to a program card, means for relatively displacing, from one row to the next, said reading means with respect to the program card, mechanical means for connecting said programming installation to said carriage for successive reading of the rows of the program card by said reading means in synchronism with the movement of said carriage, said machine being characterised in that said means for relatively displacing from one row to the next said reading means relative to the program card comprises means for adjusting the pitch of the scanned rows of the program card.

4,476,697

WOUND DRESSING

Ewald Schäfer, Wolfstein, and Harald Jung, Kreimbach, both of Fed. Rep. of Germany, assignors to Karl Otto Braun KG

Continuation of Ser. No. 141,812, Apr. 21, 1980, Pat. No. 4,391,106, which is a continuation of Ser. No. 880,150, Feb. 22, 1978, abandoned. This application May 26, 1983, Ser. No. 498,452

Int. Cl.³ D04B *23/08*

U.S. Cl. 66—193 **5 Claims**

1. A warp knitted fabric for use as a surgical bandage and dressing comprising four yarns arranged in a plurality of wales and causes including a first yarn comprising a basic stitch consturction (L1) and second, third, and fourth yarns bound in as in-laid threads (L2, L3, L4), said fourth yarn consisting of a thick, roughened binding yarn of high volume bound in warpwise, said second and third yarns consisting of cross filling long looped, highly twisted yarns of sinuous configuration having a twist of one of the Z-twisting direction and S-twisting direction, one of said second and third yarns being bound in between two adjacent wales and the other of said second and third yarns being bound in between three adjacent wales, said fourth yarn having the lap variation:

0.0–2.2.

4,476,698

KEYLESS LOCK

Nicholas Treslo, 1747 N. 79th Ave., Elmwood Park, Ill. 60635

Filed Mar. 9, 1983, Ser. No. 473,706

Int. Cl.³ E05B *37/14, 37/18*

U.S. Cl. 70—25 **8 Claims**

1. A keyless lock which eliminates the requirement for visual contact with the lock to effect disengagement thereof comprising:

a casing

a shackle with a portion thereof extending into the casing and having a locking notch formed therein,

at least one locking bar adapted to engage the locking notch of the shackle to lock the shackle within the casing,

means to release the locking bar from engagement with the locking notch thereby permitting movement of the shackle out of the casing formed by:

a forked member having one end engaging the locking bar to prevent movement thereof when in the locked position,

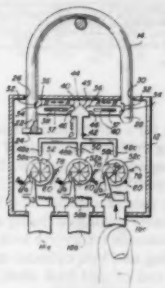
a plurality of pins on the forked member opposite the end engaging the locking bar,

a plurality of ratchet wheels, each ratchet wheel having a slot formed therein, the ratchet wheels being adapted to rotate incrementally,

means to position the ratchet wheels in an initial reference position,

push button means associated with each ratchet wheel, and being connected to a first pawl which engages and rotationally drives the ratchet wheel from its initial reference position to an incremented rotated position,

each push-button means having a predetermined numerical code to increment its respective ratchet wheel to a slot and pin alignment position,



whereby the lock can be opened without visual contact by pushing each push-button means the predetermined numerical code number to align each slot with its respective pin on the forked member, and pulling on the shackle which in turn causes the locking bar to exert a force on the forked member thereby causing the pins on the forked member to be forced into and received by the aligned slots on the ratchet wheel, permitting movement of the locking bar and releasing the shackle.

4,476,699

LOCKING DEVICE, ESPECIALLY INTENDED TO PREVENT STEALING OF BOATS PROVIDED WITH OUTBOARD MOTORS

Christer Dahlborg, Täby, Sweden, assignor to Cowab AB, Täby, Sweden

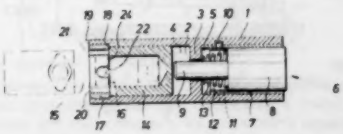
PCT No. PCT/SE82/00242, § 371 Date Mar. 4, 1983, § 102(e) Date Mar. 4, 1983, PCT Pub. No. WO83/00353, PCT Pub. Date Feb. 3, 1983

PCT Filed Jul. 13, 1982, Ser. No. 474,590

Claims priority, application Sweden, Jul. 15, 1981, 8104391

Int. Cl.³ E05B *67/36*

U.S. Cl. 70—34 **6 Claims**



1. Locking device intended to be mounted on a fuel pipe nipple (15) providing with bayonet locking pins (16), comprising an elongated external sleeve (1), having at one end an internally situated lock (6) and at the other end bayonet locking grooves (20,21,22,23) corresponding to said bayonet locking pins, characterized in that the lock (6) has an axially movable locking piston (9) cooperating with an internal sleeve (14), which is axially displaceable inside the external sleeve (1) between a retracted, first position (FIG. 2), which permits relative interconnection and release of the pipe nipple and the

locking device, and an advanced, second position (FIG. 1), in which the bayonet locking pins (16) are kept securely fixed in the bayonet locking grooves (22,23).

4,476,700

BOLT LOCK FOR A SLIDING PATIO DOOR

David L. King, 8626 54th Pl. West, Mukilteo, Wash. 98275

Filed Aug. 12, 1982, Ser. No. 407,653

Int. Cl.³ E05B 25/08

U.S. Cl. 70—99 2 Claims

1. A bolt lock for a sliding patio door, comprising, in combination, a housing comprising a pair of spaced-apart, cross-sectionally "L"-shaped side members having a lock cylinder mechanism therewithin, a pair of side frames between said side members, and a pair of slidable lock bolts, a rotatable sector gear and a rotatable small gear being all located between said side frames; a rotatable transverse lock shaft between said side members engaging said lock cylinder mechanism, a key-receiving slot in one end of said lock shaft, said sector gear being affixed on said lock shaft, a transverse shaft between said side frames, said small gear being affixed on said transverse shaft, one of said lock bolts having an arcuately curved tooth rack and also a straight toothed rack along its side edge, said arcuately curved tooth rack engaging said sector gear, said straight toothed rack being engagable with said small gear, and said small gear engaging a single, straight toothed rack on the other said lock bolt.

4,476,701

MAGNETIC LOCK AND KEY

Leslie V. Herriott, Wolverhampton, England, assignor to Lowe & Fletcher Limited, Walsall, England

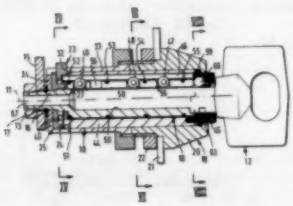
PCT No. PCT/GB81/00178, § 371 Date May 3, 1982, § 102(e) Date May 3, 1982, PCT Pub. No. WO82/00845, PCT Pub. Date Mar. 18, 1982

PCT Filed Sep. 3, 1981, Ser. No. 380,679

Claims priority, application United Kingdom, Sep. 3, 1980, 8028472

Int. Cl.³ E05B 47/00

U.S. Cl. 70—276 11 Claims



1. A lock comprising an inner member, a hollow outer member in which the inner member is mounted and a plurality of magnetic elements, wherein the inner and outer members collectively define respective paths to which the magnetic elements are confined and along which the magnetic elements can move between respective releasing positions and respective locking positions, the inner and outer members have, for each path, respective abutment surfaces facing in opposite directions transverse to the length of the path and disposed at opposite sides of the path and said abutment surfaces are engageable concurrently with respective ones of the magnetic elements when the magnetic elements occupy their locking positions, whereby relative movement of the inner and outer members in said directions is restricted or prevented by engagement of the magnetic elements with the abutment surfaces except when the magnetic elements occupy their releasing positions, characterised in that there are in the abutment surfaces of the inner member openings corresponding to respective ones of the magnetic elements and each of which openings a part of the corresponding magnetic element can enter when the element is in its releasing position and in that means is provided for preventing movement of one of said magnetic elements into the opening corresponding to another of the magnetic elements.

4,476,702

APPARATUS FOR MEASURING AND REGULATING THE POSITION OF A WIRE END OF A SPIRAL SPRING IN A COILING MACHINE

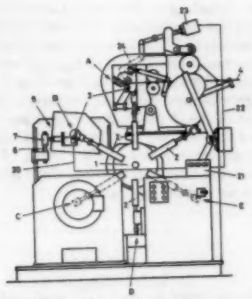
Ernst Zängerle, St. Gallen, Switzerland, assignor to Spuhl AG, St. Gallen, Switzerland

Filed Feb. 28, 1983, Ser. No. 470,668

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1982, 3212797

Int. Cl.³ B21C 51/00; B21F 3/10, 35/02

U.S. Cl. 72—15 2 Claims



1. An apparatus for measuring and regulating the position of a wire end of a spiral spring before twisting said end around an adjacent spring coil, said apparatus being associated with a machine for producing spiral springs including a coil forming station, two twisting stations, and an outlet station, and a transport device having gripping arms for conveying the coiled springs in succession to the different stations, characterized by: a reciprocable stop plate (12) mounted at a twisting station (B) in axial alignment with a coiled spring (3) at said station, said stop plate being operable to clamp an end coil of the spring against a stop member (15), a pair of inductive proximity switches (18, 19) attached to the stop plate for sensing the position of a wire end (3a) of said end coil and for conveying one of three possible output measurements to a counter (21), and a regulating motor (23) responsive to the counter for adjusting a tool in the coil forming station which determines the diameter of the spring.

4,476,703

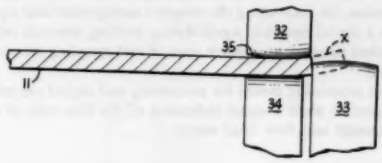
EDGE PREFORMING OF METAL PLATE

Calvin C. Williamson, Napa, Calif., assignor to Kaiser Steel (Delaware), Inc., Fontana, Calif.

Continuation of Ser. No. 390,852, Jun. 22, 1982, abandoned, which is a division of Ser. No. 160,390, Jun. 17, 1980, Pat. No. 4,353,235. This application Mar. 21, 1984, Ser. No. 591,887

Int. Cl.³ B21B 1/04

U.S. Cl. 72—130 9 Claims



1. Apparatus for preforming the longitudinal edges of flat steel plate into a finished pipe of a specified diameter comprising means for roll-forming said plate while said plate is of a sufficient excess width to provide material to serve as lever arm means during rolling,

said roll-forming means being positioned for crimping the plate toward the center thereof commencing at points spaced from said longitudinal edges and corresponding to bitter edges of the plate width required for said pipe of said specified diameter, said crimping of said edges of said plate adjacent said points being effected in a direction toward the center of said pipe to a radius approximating that required for said finished pipe while leaving a central area of the plate between said points essentially flat; and

means for shearing a bent plate along said points to form said bitter edges.

4,476,704

METHOD FOR PRODUCING FINNED TUBES

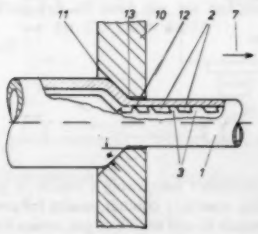
Manfred Hage, Ulm, and Gerhard Schinkoth, Neu-Ulm, both of Fed. Rep. of Germany, assignors to Wieland-Werke AG, Ulm, Fed. Rep. of Germany

Division of Ser. No. 328,756, Dec. 8, 1981, Pat. No. 4,425,942. This application Mar. 2, 1983, Ser. No. 471,289

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3048959

Int. Cl.³ B21C 1/00; B21D 53/06

U.S. Cl. 72—276 12 Claims



1. A process for manufacturing a finned tube having a circumferentially disposed plurality of internal fins, each fin extending in the longitudinal direction of the tube and being discontinuous therealong such that each fin is made up of a plurality of fin portions, said process comprising the steps of:

providing a tube having a plurality of internal fins, each fin extending in the longitudinal direction of said tube and being continuous therealong,

moving said tube through a drawing die so that it undergoes a diameter reduction associated with a decrease in cross sectional area of at least thirty percent and so that said fins are torn into a series of torn portions extending in longitudinal rows along the tube,

said torn portions being produced solely by said diameter reduction of said tube, and

further drawing the tube so as to longitudinally separate the torn portions and produce a finned tube having said plurality of fin portions.

4,476,705

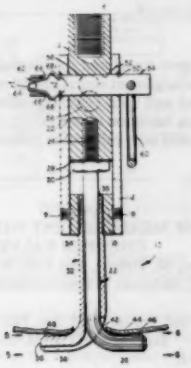
AUTOMOBILE BODY DENT PULLER

James S. Meek, 3303 Lockwood Dr., Chattanooga, Tenn. 37415

Filed Jan. 24, 1983, Ser. No. 460,151

Int. Cl.³ B21D 1/06

U.S. Cl. 72—478 18 Claims



18. A tool for straightening indentations in sheet metal comprising, a pair of rods concentrically mounted about a common axis, the outer rod being hollow, the inner rod being longer than the outer rod and extending therethrough, each rod having a work engaging arm, each arm being disposed angularly at substantially the same angle to the axis, said rods being pivotable relatively to one another about said axis from a disposition wherein said arms are superposed one above the other to a disposition wherein said arms face oppositely to one another, and means for fastening a pulling force applying means to said inner rod along said common axis.

4,476,706

REMOTE CALIBRATION SYSTEM

David M. Hadden, Los Altos, and Eric S. Micko, Los Altos Hills, both of Calif., assignors to Delphian Partners, Sunnyvale, Calif.

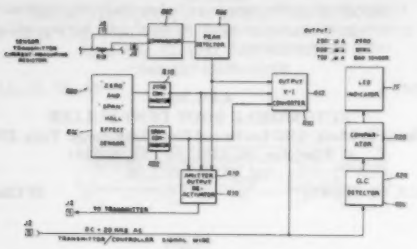
Filed Jan. 18, 1982, Ser. No. 340,074

Int. Cl.³ G01N 27/12

U.S. Cl. 73—1 G 10 Claims

1. Apparatus for remote calibration of combustible gas measurement apparatus or the like comprising a sealed sensor transmitter unit and a remotely located control apparatus for said unit, said sensor transmitter unit comprising means for detecting the presence of combustible gas and for transmitting an output signal responsive to the concentration thereof to said remotely located control apparatus, means for determining whether said output signal is within a predetermined operative signal range, and for transmitting a sensor fault signal to said remotely located control apparatus, zero calibration input channel means for generating and transmitting a zero calibration initiating signal to said remotely located control apparatus in response to an externally applied activation signal, span calibration means for generating and transmitting a span cali-

bration initiating control signal to said remotely located control station in response to an externally applied activation signal, and means for receiving an acknowledgement signal from said remotely located control station, and said remotely located control apparatus comprising means for receiving said



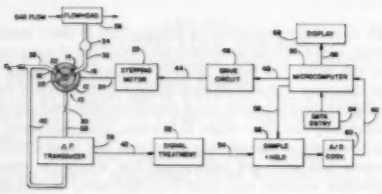
output signal, zero signal and span signal, means for transmitting an acknowledgement signal to said sensor unit, and means for storing zero and span response calibration values of said sensor unit upon initiation of respective zero and span calibration cycles by said zero calibration means and span calibration means.

4,476,707

GAS FLOW MEASUREMENT WITH DETENTED CHOPPER VALVE

Henry L. Burns, St. Helena, and Erik W. Peterson, Calistoga, both of Calif., assignors to Bear Medical Systems, Inc., Riverside, Calif.

Filed Apr. 8, 1982, Ser. No. 366,770
Int. Cl.³ G01F *1/36, 25/00*
U.S. Cl. 73—4 R **19 Claims**



1. A gas flow measuring system, comprising:

flow head means for developing a flow-related pressure in response to a flow of gas;

valving means, having an outlet port and first and second inlet ports, said first inlet port adapted for receiving a selected reference pressure, said second inlet port connected to said flow head means to receive said flow-related pressure therefrom, said valving means being movable between a first position in which said first inlet port communicates with said outlet port, and a second position in which said second inlet port communicates with said outlet port;

a differential pressure transducer having a first pressure port adapted for receiving said selected reference pressure and a second pressure port in fluid communication with said outlet port, said transducer being adapted to produce an analog electrical signal having a reference value when said valving means is in said first position and a pressure-indicative value when said valving means is in said second position;

means for generating a clock signal having a selected frequency;

driving means, responsive to said clock signal, for moving said valving means between said first and second positions with a first switching frequency proportional to said selected frequency;

sampling means, responsive to said clock signal, for receiving said analog electrical signal only during sampling intervals established periodically with a second switching frequency at least double said first switching frequency and coordinated therewith so that said sampling intervals occur when said analog electrical signal has either said reference value or said pressure-indicative value;

digitizing means, electrically coupled to said sampling means, for converting the sampled analog electrical signal to a digital electrical signal during holding intervals established between successive ones of said sampling intervals; and

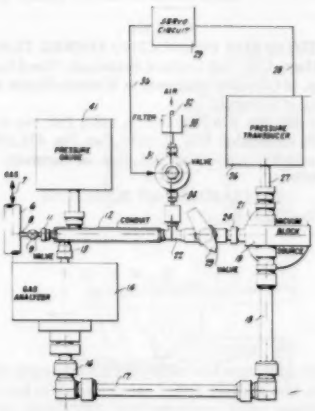
signal processing means for processing said digital electrical signal to yield a signal indicative of the flow rate of gas through said flow head means.

4,476,708

FLOW CONTROLLER

Kenneth J. Baker, Moraga; Keith E. Buck, Alamo; Irving C. Chase, El Sobrante; Robert B. Fraser, El Cerrito, and Clive Miles, Oakland, all of Calif., assignors to Thoratec Laboratories Corporation, Berkeley, Calif.

Filed Nov. 12, 1982, Ser. No. 440,816
Int. Cl.³ G01N *31/00*
U.S. Cl. 73—23 **10 Claims**

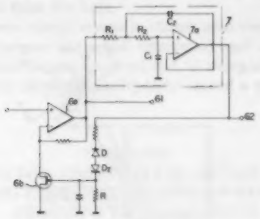


1. A flow controller comprising a source of gas to be analyzed, a vacuum source, a conduit, means for connecting one end of said conduit to said source of gas, means for connecting the other end of said conduit to said vacuum source, a duct, means for connecting one end of said duct to said one end of said conduit, means for connecting the other end of said duct to said vacuum source, a gas analyzer, means for connecting said gas analyzer to said one end of said conduit and to said vacuum source, means for admittng another gas to said conduit at a predetermined point between said one end of said conduit and said vacuum source, and means having a Peclet number of at least 4 incorporated in said conduit between said one end thereof and said predetermined point.

4,476,709
KNOCK DETECTING APPARATUS FOR INTERNAL COMBUSION ENGINES

Tadashi Hattori, Okazaki; Tadashi Ozaki, Gamagori; Kazuhiko Miura, and Yoshinori Ootsuka, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 17, 1982, Ser. No. 408,896
Claims priority, application Japan, Aug. 18, 1981, 56-129160
Int. Cl.³ G01L 23/22
U.S. Cl. 73—35 4 Claims



1. A knock detecting apparatus for internal combustion engines comprising:

knock detecting means for detecting the occurence of knocking in an engine;

automatic gain control means for processing an output signal of said knock detecting means to form a background noise signal having a substantially constant level and a knock signal;

comparator means responsive to said background noise signal and said knock signal to determine the presence of knocking in said engine;

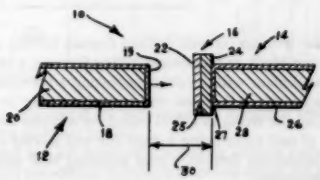
said automatic gain control means having a negative feedback loop including frequency selecting means for providing the gain control of said automatic gain control means with frequency selectivity,

wherein said automatic gain control means includes voltage controlled means for effecting said gain control, and wherein said frequency selecting means comprises a low-pass filter for connecting an output of said control means to said voltage controlled means, said filter having a cutoff frequency lower than knock frequencies.

4,476,710
DETONATION TRANSFER EVALUATION TECHNIQUE

Alan B. Zimmerschied, Renton, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 24, 1983, Ser. No. 469,369
Int. Cl.³ G01N 33/22
U.S. Cl. 73—35 5 Claims



1. A detonation transfer evaluation method comprising the steps of:

mounting a donor explosive component opposite an acceptor explosive component so that a gap of a given distance exists between said components;

selecting at least one penalty barrier;

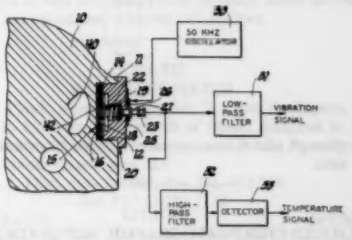
placing in said gap at least one of said penalty barriers, said one penalty barrier having a first layer and a second layer in contact with each other, said acceptor explosive component having said second layer of said one penalty barrier in contact therewith at an interface; and

detonating said donor explosive component to send a shock pulse into said acceptor explosive component through said one penalty barrier.

4,476,711
COMBINED VIBRATION AND TEMPERATURE SENSOR

Jeffrey S. Gutterman, Hilton, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1983, Ser. No. 487,452
Int. Cl.³ G01M 15/00
U.S. Cl. 73—35 3 Claims



1. A combined vibration and temperature sensor for an internal combustion engine component comprising, in combination:

a piezoelectric element effective to generate an output voltage when subjected to vibration and having an electrical impedance varying with temperature, within a predetermined temperature range, in a substantially predetermined manner at a predetermined electrical frequency, said piezoelectric element being mechanically and thermally coupled to the engine component to share the vibrations and temperature thereof;

an electrical resistor connected in series with the piezoelectric element, said resistor having an impedance effective to produce a predetermined impedance ratio with said piezoelectric element at a predetermined temperature within said predetermined temperature range; and

means effective to apply a constant predetermined alternating electrical voltage across said series connected piezoelectric element and resistor and separately sense the voltage generated across the piezoelectric element in response thereto and the voltage generated thereacross in response to vibration thereof, whereby the temperature and vibration of said engine component are sensed.

4,476,712
SAMPLING HIGH PURITY WATER FOR TRACE ION DETERMINATION

Gerald L. Carlson, Mt. Lebanon Township, Allegheny County, and Warren E. Snider, Elizabeth Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

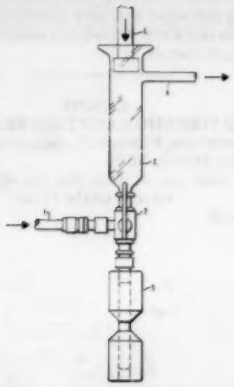
Filed Aug. 6, 1979, Ser. No. 64,319
Int. Cl.³ G01N 31/08
U.S. Cl. 73—61.1 C 8 Claims

1. Apparatus for collecting and concentrating trace ions from a pressurized aqueous sample in a sample line, comprising:

(A) a three-way valve connected to said sample line;

(B) a syringe connected to said three-way valve, whereby said sample can flow through said three-way valve into said syringe; and

(C) a concentrator column connected to said three-way valve whereby said sample can flow from said syringe



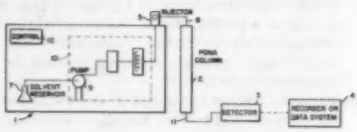
through said three-way valve into said concentrator column.

4,476,713

LIQUID CHROMATOGRAPHIC SEPARATION OF HYDROCARBONS

Thomas V. Alfredson, San Francisco, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Aug. 31, 1982, Ser. No. 413,557
Int. Cl.³ G01N *31/08*
U.S. Cl. 73—61.1 C **23 Claims**



10. A method for the separation and analyses of paraffins, olefins, napthenes, and aromatics contained in a hydrocarbon mixture using chromatographic procedures, the steps comprising:

(a) providing a chromatographic column packed with a polystyrene/divinyl benzene microparticulate material having a pore size of less than about 100 Å, said material being slurry packed in a solvent medium;

(b) passing said hydrocarbon mixture through said packed column using a mobile phase comprising a solvent having a solvent strength parameter, ϵ°, of less than about 0.1;

(c) eluting the paraffins, olefins, napthenes, and aromatics from said column; and

(d) detecting the presence of said components.

4,476,714

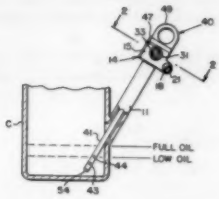
ENGINE OIL LEVEL SENSOR

Leon G. Barry, and Willis Rieman, both of Shelby, N.C., assignors to Fasco Controls Corporation, Shelby, N.C.

Filed Sep. 21, 1983, Ser. No. 534,164
Int. Cl.³ G01F *13/04, 23/22*
U.S. Cl. 73—118 **14 Claims**

1. A fluid level sensor for a reservoir of the type having thereon an integral tube, which opens at its inner end on the reservoir, and at its outer end above the reservoir, comprising an elongate dipstick removably mounted in said tube, and having thereon a stem portion projecting slidably through the bore in the tube and into the interior of said reservoir normally to have the inner end thereof immersed a first predetermined distance below the level of the fluid in the reservoir, when the fluid is at its desired level,

a pair of spaced, temperature sensitive elements mounted on said stem portion adjacent said inner end thereof normally to extend second and third distances, respectively, beneath the desired level of fluid in the reservoir, and corresponding, respectively, to low and excessively low levels of the fluid in said reservoir, and



means including an electrical indicator circuit connected to said elements and operative to produce a warning signal when the difference in the ambient temperatures sensed by said two elements exceeds a predetermined value,

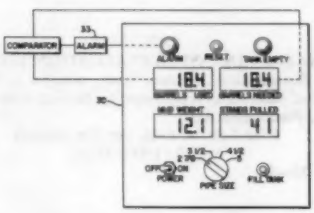
said means comprising at least one electrical contact on said stem portion slidably engagable with said tube for completing an electrical connection between said elements and said indicator circuit, when said dipstick is mounted in said tube, and for interrupting said connection, when said dipstick is removed from said tube.

4,476,715

MUD METERING TANK MONITORING SYSTEM

Jack L. Murphy, 14215 Paradise Valley, Houston, Tex. 77069

Filed Mar. 11, 1983, Ser. No. 474,387
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—151 **3 Claims**



1. For use with an oil well drilling derrick having a sheave on the crown block and a bottom pulley forming a block and tackle arrangement with a cable supporting a traveling block adapted to be attached at one end to a pipe string for raising and lowering the string in a drill casing by a prime mover the other end of said cable being a dead line and having a weight indicator connected thereto, a mud metering tank monitoring system comprising:

(a) a tank having a mud pump and a fluid connection between said tank and the drill casing,

(b) pipe string counting means connected to be driven by a sheave in the crown block and to indicate pipe stands lowered into and removed from the drill casing only when a pipe string is being carried by the traveling block,

(c) a pair of vertically spaced apart mud sensors in said mud metering tank,

(d) a computer panel connected to receive input signals from elements (b) and (c),

(e) a display panel having indication means showing barrels of mud needed, barrels used, mud weight in the tank and stands pulled connected to receive signals from said computer panel,

(f) recorder means connected to said display panel to keep a running log of quantities listed in (e) plus date and time of day, the recorder is energized by the stand counter and records the above data each time a stand of drill pipe is removed from the hole,

(g) and alarm circuit means in circuit with elements (d) and (e) to compare the actual volume of mud used with the calculated volume required and to energize an alarm to the driller should a discrepancy exceed a predetermined limit.

4,476,716

METHODS FOR LOCATING OIL OR GAS DEPOSITS EMPLOYING TEMPERATURE AND/OR GEOTHERMAL GRADIENT MEASUREMENTS

Lloyd C. Fons, 14410 Cindywood Dr., Houston, Tex. 77079

Filed May 26, 1983, Ser. No. 498,279
Int. Cl.³ E21B *47/06*
U.S. Cl. 73—154 **20 Claims**

17. A method for predicting the likelihood of encountering oil or gas deposits below a location, which method comprises:

determining a first geothermal gradient G_1 across a first depth interval beneath said location;

determining a second geothermal gradient G_2 across a second depth interval below said first interval; and

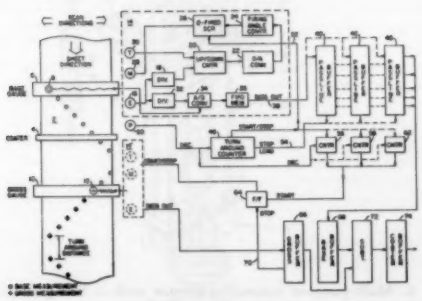
comparing the values of G_1 and G_2, wherein for G_1 of greater value than G_2 it is likely than an oil or gas deposit is present below said second interval.

4,476,717

SCANNING GAUGE APPARATUS

Richard F. Murphy, 15 Bond St., Wilmington, Mass. 01887

Filed May 22, 1981, Ser. No. 266,563
Int. Cl.³ B21B *39/14*
U.S. Cl. 73—159 **2 Claims**



1. In an apparatus for providing the samespot measurement of moving material having,

first and second transverse scanning gauges each having a sensor associated therewith disposed along the length of a moving sheet of material, means for causing said first and second second scanning gauge sensors to traverse across said moving sheet of material at a rate proportional to the instantaneous line speed of said moving material, and to reverse the direction of traversing at each edge of said material, means for delaying the initiation of the scan of said second gauge sensor until a first predetermined amount of material has passed under said first gauge, whereby the same spot of material is positioned under said first and second transverse gauges at the start of the scans of their respective sensors, the improvement comprising,

means for delaying the initiation of each scan of said first gauge sensor until a second predetermined amount of material has passed below said first gauge, whereby a sufficient time is provided for said second scanning gauge sensor to complete its reversing operation in instances where the line speed of said moving sheet of material has increased after passage of said material under said first gauge,

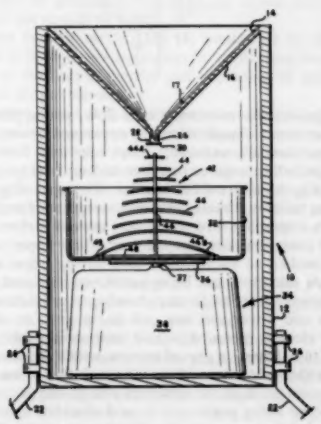
wherein said means for delaying the initiation of the scan of said first gauge sensor includes a means for measuring the amount of material passing below the first gauge at the conclusion of each first gauge scan in a given direction, and for initiating the first gauge scan in the reverse direction only after the amount of material passed below the first gauge equals the product of the time required for reversal of said first gauge scan direction times the maximum line speed said material can achieve.

4,476,718

RAIN RATE METER

Vernon G. Plank, Mansfield; Stephen D. Crist, Burlington, and Dennis L. LaGross, Bedford, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 7, 1983, Ser. No. 482,754
Int. Cl.³ G01W *1/14*
U.S. Cl. 73—171 **14 Claims**



1. A rain rate meter comprising:

a housing having an open top for surface for receiving rainfall, said top surface having a funnel-shaped rain directing element therein, and said funnel-shaped element having an outlet port centrally located at the bottom thereof;

dispersing means located within said housing and positioned adjacent the exterior of said outlet port of said funnel-shaped element for intersecting rain water flowing from said outlet port in order to substantially eliminate the adverse effects of the downward momentum of said flowing rain water;

means located within said housing adjacent said outlet port for collecting said falling rain water;

means situated within said rain water collecting means adjacent said dispersing means for receiving said falling rain water and depositing said falling rain water in a gentle and gradual manner into said collecting means; and

means operably connected to said collecting means for monitoring the weight of said collected rain water over a preselected period of time;

whereby accurate determinations of collected rainfall weight and rainfall rate can be accurately made.

4,476,719

LIQUID MEASURING DEVICES

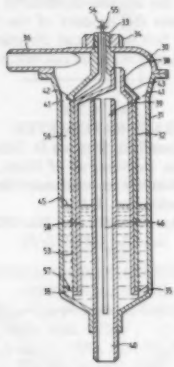
Thomas D. Millar, and Dougald S. M. Phillips, both of Hamilton, New Zealand, assignors to AHI Operations Limited, Manukau, New Zealand

Filed May 12, 1982, Ser. No. 377,425

Claims priority, application New Zealand, May 12, 1981, 197066

Int. Cl.³ G01F *1/20*

U.S. Cl. 73—200 **9 Claims**



1. Apparatus for measuring milk flow, said apparatus comprising an outer chamber having upper and lower parts and ranged substantially vertically in use, inlet milk flow directing means, including a curved surface and an inlet port directed tangentially to said curved surface, for separating air from inflowing milk by directing the inflowing milk from said inlet port into a spinning flow along said curved surface and then into said outer chamber, a cap closing off the upper part of said outer chamber, an intermediate tube having upper and lower open ends, said lower end being positioned in spaced proximity to said lower part of said outer chamber to provide an opening between said lower end and said lower part, an electrically resistive element mounted on said intermediate tube, a further internal tube having a gap of narrow width and long vertical length within said intermediate tube such that in use a pool of milk is maintained on the upstream side of said gap, said resistive element being positioned in said chamber to require the milk level at the upstream side of said gap to cover the part of the resistive element according to said milk level in a manner such that the impedence of the resistive element depends on said milk level, said impedence providing an indication of the level of liquid on said upstream side, and data processing means responsive to the impedence of said resistive element for providing information selected from indication and recordal of milk flow rate and milk yield according to the milk level at the upstream side of said gap.

4,476,720

UNIDIRECTIONAL FLUIDFLOW SENSOR SYSTEM

Raouf A. Ismail, Concord, and Jonathan T. Mead, Framingham, both of Mass., assignors to Cambridge Aero Instruments, Inc., Billerica, Mass.

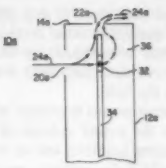
Filed Jun. 14, 1982, Ser. No. 387,950

Int. Cl.³ G01F *1/68, 5/00*

U.S. Cl. 73—202 **15 Claims**

1. A unidirectional fluidflow sensor system comprising:

a sensing chamber for placement in a fluidflow to be monitored; said chamber including input port means which includes a hole on the side of said chamber facing toward the fluidflow and output port means which includes two holes, one on each adjacent side of said chamber and disposed transversely to said fluidflow;



a sensing element in said chamber in the path between said input and output port means; and

means, responsive to said element, for detecting a change in flow between said input and output port means.

4,476,721

MULTI-PURPOSE MEASURING DEVICE WITH A HINGED DISPLAY

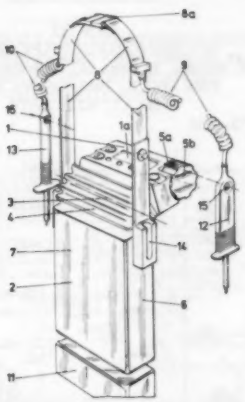
Karl Hochreuther, Nuremberg, Fed. Rep. of Germany, and Jörg Tragatschnig, Zell am See, Austria, assignors to Metrawatt GmbH, Nuremberg, Fed. Rep. of Germany

Filed Aug. 10, 1983, Ser. No. 522,053

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1982, 3229688

Int. Cl.³ G01D *11/24, 11/30*

U.S. Cl. 73—431 **22 Claims**



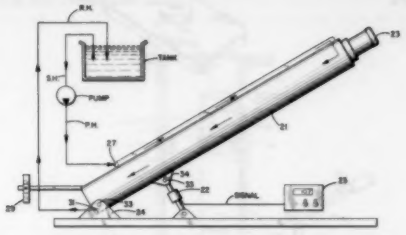
1. Multi-purpose measuring device with a tilting display, comprising a display assembly with a housing for visually indicating a measured value of a variable to be analyzed, an auxiliary assembly with another housing separate from said display assembly housing for performing measurements, a hinge interconnecting said housings permitting relative tilting of said housing in two directions into different places at an angle relative to each other and into a common plane, and a carrying strap fastened in vicinity of said hinge, said auxiliary assembly having dimensions and weight in proportion to said display assembly causing the center of gravity of the measuring device to lie in vicinity of said auxiliary assembly and causing said auxiliary assembly to hang downward from said carrying strap with said display assembly disposed above said auxiliary assembly.

4,476,722

CONTINUOUSLY MONITORING AND SELF-CLEANING LIQUID DENSITY MEASUREMENT SYSTEM

James E. Bentkowski, Oklahoma City, Okla., assignor to Scientific Resources, Inc., Oklahoma City, Okla.

Filed Sep. 29, 1982, Ser. No. 426,955
Int. Cl.³ G01N 9/06
U.S. Cl. 73—434 10 Claims



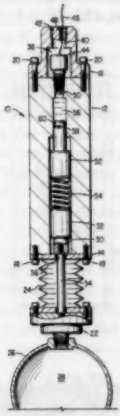
1. A system for continuously monitoring and measuring the actual physical weight or density of a liquid whether the liquid is in a static state or flowing state comprising a base, a container having two ends pivotable thereto and through which the liquid flows, a weight measuring mechanism attached to said container to measure the weight of the liquid in said container and means within said container to avoid build-up of material inside said container.

4,476,723

DENSITY SENSOR

Paul Byrne, Plano, Tex., assignor to Analog Data Systems, Dallas, Tex.

Filed Mar. 14, 1983, Ser. No. 475,045
Int. Cl.³ G01N 9/10
U.S. Cl. 73—453 18 Claims



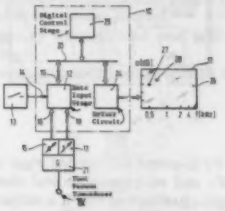
1. A density sensor, comprising:
a float;
means for sensing the buoyant force of said float;
means for translating the buoyant force of said float to said means for sensing; and
means for attenuating high frequency acceleration components present in the buoyant force of said float to prevent them from being translated by said means for translating to said sensor means.

4,476,724

AUDIOMETER

Gerd-Wolfgang Götze, Berlin, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 5, 1982, Ser. No. 439,423
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1981, 3145566
Int. Cl.³ A61B 4/07
U.S. Cl. 73—585 19 Claims



1. Audiometer to obtain test sounds, or frequency, versus perceived amplitude in diagrammatic x-y coordinate output form for testing hearing of a person for tones, music and speech having
an output unit (11) in form of a coordinate system in which amplitude forms one coordinate parameter and sound, or frequency another coordinate parameter;
means (21) for generating electrical test signals representative of test sounds or tones;
amplitude control means (15, 16) connected to said test sound or tone generating means for controlling the amplitude of the output thereof and providing an amplitude control output signal;
tone control means (17, 18) connected to said test sound or tone generating means for controlling the nature of the test sound or frequency of the test tone thereof, and providing a test sound control output signal;
test person transducer means (TX) transducing the test sound, or tone signals of the nature of the sound or at the frequency of the test tone and the level controlled by the tone control means and the amplitude control means, respectively;
and test person controlled response means (13, 14) providing an electrical perception output signal if a predetermined test sound, or tone has been perceived,
comprising, in accordance with the invention,
an electronic digital matrix control circuit (10) receiving said amplitude control output signal, said test sound or tone control output signal and the perception output signal;
and wherein the output unit comprises a liquid crystal display (LCD) in matrix form (11, 26) connected to and controlled by said digital matrix control circuit and providing an output in x-y coordinate form of perceived amplitude of a respective test sound or frequency at the instant of reception of the perception output signal.

4,476,725

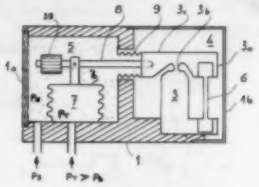
DIFFERENTIAL PRESSURE GAUGE

Jacques Chorel; André Migeon, both of Chabeuil, and Michel Torregrosa, Valence, all of France, assignors to Crouzet, Paris, France

Filed Jul. 19, 1982, Ser. No. 400,118
Claims priority, application France, Jul. 20, 1981, 8114230
Int. Cl.³ G01L 7/06, 9/00
U.S. Cl. 73—704 6 Claims

1. In a differential pressure gauge comprising wherein a piezoelectric testing body with a vibrating blade is fixed at one end on a fixed frame and at the other end on one of the arms of a balance beam, mounted on a pivot axis, transmitting thereto a force resulting from the difference in pressure ($P_T - P_s$) exist-

ing between two distinct chambers, of which at least one is deformable, and subjected respectively to the pressures of which the difference is to be measured, the improvement comprising the testing body and the balance beam are disposed in a first rigid chamber, a vacuum in said first chamber, the balance beam being subjected to the action of a force, resulting from the deformation of an expansible chamber subjected to



the pressure P_T disposed in a second rigid chamber subjected to pressure P_b and an expansible seal element mounted between said rigid chambers so that it is subjected on one side to said vacuum and on the other side to said pressure P_b and of which the effect resulting from the difference in pressure between said vacuum and pressure P_T is applied along its longitudinal axis passing through the pivot axis of the balance beam.

4,476,726

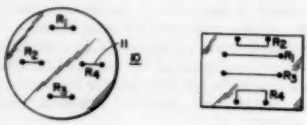
PRESSURE TRANSDUCERS EXHIBITING LINEAR PRESSURE OPERATION

Anthony D. Kurtz, Englewood; Joseph R. Mallon, Franklin Lakes, and Timothy A. Nunn, Ridgewood, all of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Aug. 19, 1982, Ser. No. 409,537

Int. Cl.³ G01L *9/06*

U.S. Cl. 73—708 **9 Claims**



1. A pressure transducer, comprising:

a first transducer assembly comprising a semiconductor diaphragm of a circular configuration having a plurality of pressure sensitive resistors located thereon, with said resistors relying on the piezoresistive effect to provide a change in resistance according to the magnitude of force applied to said diaphragm, of a given nonlinearity

a second transducer assembly comprising a semiconductor diaphragm of a rectangular configuration having a plurality of pressure sensitive resistors located thereon, with said resistors relying on the piezoresistive effect to provide a change in resistance according to the magnitude of force applied to said diaphragm, to produce an output with a nonlinearity opposite to the above said nonlinearity and means connecting said piezoresistive elements of said first and second assemblies together to form a composite transducer with a minimum nonlinearity.

4,476,727

METHOD OF MATERIALS TESTING

Marion N. Hawk, 6304 N. Askew, Kansas City, Mo. 64118, and James P. Lewis, 7803 Aleta Dr., Spring, Tex. 77060

Filed Aug. 17, 1982, Ser. No. 408,940

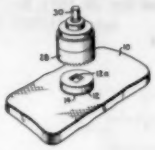
Int. Cl.³ G01N *3/22, 29/04*

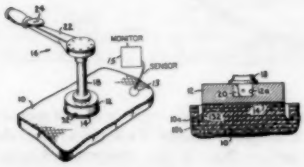
U.S. Cl. 73—847 **6 Claims**

1. A method of measuring the structural strength of a material which comprises at least a portion of a structure without subjecting the entire structure to testing forces, said method comprising the steps of:

isolating a small segment of said material;

adhesively securing a drive head to said isolated segment;





applying a known torque force to said drive head; and

translating said known torque force into a measurement of said structural strength.

4,476,728

VORTEX FLOW METER

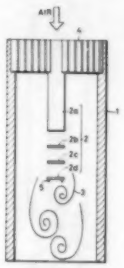
Hichiro Otani, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,217

Claims priority, application Japan, Aug. 19, 1981, 56-123446

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—861.22 **1 Claim**

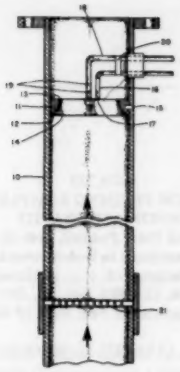


1. A vortex flow meter comprising a conduit for the passage of a fluid therethrough from an upstream end to a downstream end, vortex generating means disposed in said conduit and having a surface at the downstream end thereof disposed at right angles with respect to the axis of said conduit, a plurality of posts secured to said surface and protruding therefrom in the downstream direction and hot wire means comprised of two wires symmetrically disposed with respect to each other on said posts under tension in a substantially zigzag fashion and in spaced relation to said surface for detecting the frequency of Karman's vortices generated downstream of said vortex generator means.

4,476,729
APPARATUS FOR MEASURING GAS VELOCITY

Wilbur L. Stables, Matoaca; James J. Cooksey, Colonial Heights, and Harry L. Newell, Jr., Richmond, all of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 2, 1982, Ser. No. 384,367
Int. Cl.³ G01F 1/42, 1/46
U.S. Cl. 73—861.61 1 Claim



1. Apparatus for determining the velocity of a gas in a gas supply duct, comprising:

(a) a flow nozzle having an inlet opening for receiving the gas and an outlet opening for expelling the gas after it has been accelerated through a throat connecting the inlet opening and the outlet opening, the throat narrowing in a curve from the inlet opening to the outlet opening, the nozzle being mounted in the duct coaxially and in fluid-tight relationship therewith, the cross-sectional area of the duct and the cross-sectional area of the inlet opening being substantially identical, the cross-sectional area of the outlet opening being 40 to 60 percent that of the duct:

(b) a pitot tube, comprising an impact tube and a static tube mounted in parallel through the duct downstream of the nozzle and both bending upstream toward the nozzle parallel to the duct axis, the opening of the impact tube being located in the volume bounded by the cross-sectional area of the outlet opening and a distance of up to 6.25 percent of the duct inside diameter downstream of the outlet opening, the static tube having a plurality of apertures in the portion thereof located in the volume bounded by the cross-sectional area of the outlet opening and a distance of up to 12.5 percent of the duct inside diameter downstream of the outlet opening; and

(c) a perforated plate, mounted in the duct perpendicular to the duct axis a length of approximately nine times the duct inside diameter upstream of the nozzle.

4,476,730
ORIFICE METER WITH PRESSURE VENTING AND EQUALIZING SAFETY DEVICE

Richard S. Brumm, Orinda, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Sep. 30, 1982, Ser. No. 429,621
Int. Cl.³ G01F 1/42
U.S. Cl. 73—861.61 12 Claims

1. An orifice meter comprising:

a body including a pair of walls having aligned circular flow passages therethrough;

a carrier movable between said walls;

means for moving said carrier between a first position aligned with said flow passages and a second position displaced therefrom;

an orifice disc removably carried on said carrier;

an access opening through one of said walls aligned with said second position;

means sealing around said access opening when said carrier is in said second position; and

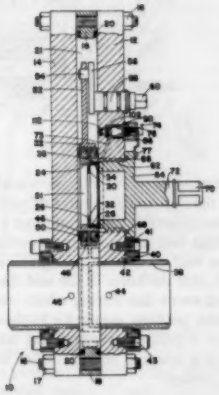
a closure member normally covering said access opening;

said orifice meter being characterized in that:

there are interengaging means on said closure member and said one wall which require at least partial rotation of said closure member for release thereof;

a valve passageway through said one wall adjacent said access opening;

a venting passage from said passageway to the exterior of said body;



the inner end of said passageway forming an equalizing passage to the interior of said body displaced from said access opening;

a transfer duct from said access opening to said passageway intermediate said venting and equalizing passages;

a valve member axially movable in said passageway and operative in a first position to seal off said venting passage and open said equalizing passage, and in a second position to seal off said equalizing passage and open said venting passage; and

means on said closure member and said valve member which are mutually engaged only when said valve member is in said first position to prevent rotation of said closure member.

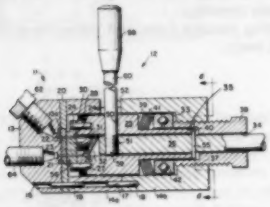
4,476,731
INJECTION VALVE FOR LIQUID CHROMATOGRAPHIC COLUMN AND SYSTEM THEREFOR

Andrew R. Charney, Bellefonte; Paul W. Kercher, Pennsylvania Furnace, and William America, State College, all of Pa., assignors to Scientific Systems, Inc., State College, Pa.

Filed Mar. 3, 1983, Ser. No. 471,473
Int. Cl.³ G01N 1/10
U.S. Cl. 73—863.73 9 Claims

1. An injection valve system for liquid chromatographic columns comprising a valve body, said valve body having in axial alignment a cap, a stator, a rotor and an indexing shaft, said cap comprising a forward end of said stator, said cap having a plurality of ports each of said ports having a passageway in the direction axially of the said stator and each terminating in a flat portion of the cap, said rotor located internally of said stator, said rotor being open in the direction of said cap and said cap closing said opening when said cap and said stator

is assembled, said rotor having an axial concentric bore, a disc closing off the bore of the rotor at the portion thereof facing the cap, said disc having a plurality of bores in axial alignment with the bores of the cap terminating at said flat portion thereof, said disc having a plurality of conduits mounted on the portion of the disc that faces the open interior of said rotor, each of said conduits having one end terminating at one of said bores of said disc and its other end terminating at one other of said bores, a stator disc positioned between said cap at the flat portion thereof and the said disc against the surface opposite to the one having said conduits, said stator disc having a plurality



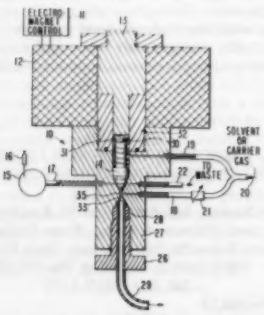
of axially disposed bores in alignment with the bores of said flat portion of the cap and the bores of said rotor mounted disc, means mounted between said rotor and a rearward end of said stator to retain said stator disc in its position, removable means for rotating said rotor and said disc carrying said conduits whereby to alter the bores of the said disc with respect of said bores of said stator disc during which one preselected conduit is in operative position, means for further indexing into operative position a different conduit and taking out of operative position a first selected conduit when said removable means has been removed.

4,476,732

SEPTUMLESS JET STREAM ON-COLUMN INJECTOR FOR CHROMATOGRAPHY

Frank J. Yang, Danville, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 21, 1983, Ser. No. 487,372
Int. Cl.³ G01N *1/10*
U.S. Cl. 73—863.73 **13 Claims**



1. A jet stream on-column injector for injection of a liquid sample directly onto a chromatographic column, comprising:

an injector body having an interior cavity sealed from ambient, and having a sample feed line for introducing sample to a sample groove formed on a surface within said cavity, and having a mobile phase feed line for introducing a mobile phase under pressure to the inlet end of said cavity;

a plunger member positioned within said cavity, said plunger member sealingly engaging with the outlet end of said cavity; and

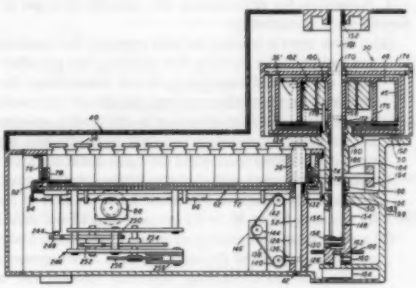
displacement means attached to said plunger, said displacement means being capable of producing linear displacement of said plunger to thereby withdraw said plunger from said sealed engagement with said outlet end of said cavity whereby a jet stream of said mobile phase flows around the exterior of said plunger and sweeps said sample from said groove through the exit end of said injector body.

4,476,733

SAMPLER FOR FEEDING SAMPLES IN GAS CHROMATOGRAPHY

Wolfgang Chlosta, and Peter Pospisil, both of Uberlingen, Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Jul. 12, 1982, Ser. No. 397,611
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130245
Int. Cl.³ G01N *35/04, 35/06*
U.S. Cl. 73—863.91 **7 Claims**



1. A sampler for sequentially feeding samples from a sample vessel head space to an inlet of a gas chromatograph; said sampler comprising:

a first heatable sample vessel store having a plurality of sample positions, said store being adapted for stepwise advancement and including a rotatably mounted heatable oven block having a circular array of axial throughbores around the rotational axis of said block and a stationary base plate having an aperture alignable with each of said throughbores at a transfer station;

a second sample vessel store adapted for stepwise advancement;

means for transferring one sample vessel at a time from said second store to one of said sample positions in said first sample store, said transfer occurring at said transfer station;

means for advancing said sample vessel from said transfer station to a sampling station;

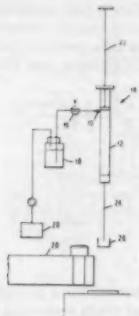
means for causing a needle to penetrate into said head space of said sample vessel whereby a head space sample can be transferred to said inlet; and

means for synchronously controlling said first store, said second store, said sample vessel transfer means and said needle penetration of said sample vessel.

4,476,734
WET NEEDLE SAMPLER FOR USE WITH A GAS CHROMATOGRAPH

Thomas M. Banks, Waterbury, Conn.; Raymond R. Ruckel, Garrison, N.Y.; Samuel F. Spencer, Danbury, and John Q. Walker, Brookfield Center, both of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,900
Int. Cl.³ G01N 1/14
U.S. Cl. 73—864.16 6 Claims



1. In an automatic sample handler having a syringe with a barrel with a needle at one end and a plunger inserted into the barrel at the other end and also having a port through the body of the barrel, the method of taking samples comprising:

(a) pumping a solvent into the port through the barrel and out the needle while the end of the plunger is withdrawn beyond the port so that the syringe is back flushed of contaminants and the barrel filled with solvent,

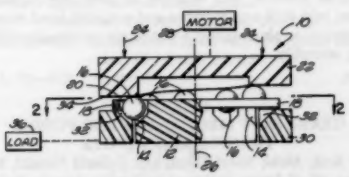
(b) inserting the end of the plunger past the port in the barrel to expel through the needle solvent introduced by step (a), and

(c) drawing a liquid sample material up into the barrel through a needle by partially withdrawing the plunger from the barrel after completion of cleaning of the syringe using steps (a) and (b) to take a sample.

4,476,735
POSITIONING APPARATUS

Gill Cantwell, 2434 Purdue Ave. #17, Los Angeles, Calif. 90064

Filed Sep. 30, 1982, Ser. No. 431,480
Int. Cl.³ F16H 33/10, 27/00, 29/00; B23B 29/24
U.S. Cl. 74—84 R 16 Claims



1. Incremental positioning apparatus comprising:

a first member having a first plurality of substantially V shaped force receiving surfaces of a first predetermined spacing;

a second member disposed adjacent said first member and having a second plurality of substantially V shaped force receiving surfaces of a second predetermined spacing, said second predetermined spacing being different from said first predetermined spacing;

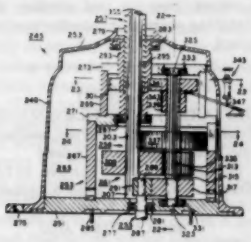
a driving means disposed adjacent said first and second member;

means for moving said driving means into simultaneous engagement with said first and second V shaped surfaces for aligning at least one of said second V shaped surfaces with one of said first V shaped surfaces to intermittently move a load connected to one of said members to a desired position.

4,476,736
TRANSMISSION FOR A LAUNDRY MACHINE

Doran D. Hershberger, Sycamore, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 304,536, Sep. 22, 1981, Pat. No. 4,434,546, which is a division of Ser. No. 077,784, Sep. 21, 1979, Pat. No. 4,327,302. This application Apr. 22, 1983, Ser. No. 487,923
Int. Cl.³ F16H 3/22, 37/06
U.S. Cl. 74—341 14 Claims



1. A transmission mechanism for a laundry machine, the transmission mechanism comprising:

a housing having a plurality of wall means defining a chamber therein, said wall means of said plurality thereof including a pair of opposite end walls, and a sidewall interposed between said opposite end walls;

a supporting structure seated on one of said opposite end walls within said chamber and including a pair of spaced apart supports disposed generally between said opposite end walls, respectively;

an input shaft journaled in said one opposite end wall so as to extend therethrough into said chamber and including a first free end adjacent said one opposite end wall within said chamber, and an input gear on said first free end, said input shaft being selectively rotatable unidirectionally and also so as to oscillate;

a tubular output shaft extending through one of said supports and journaled in the other of said opposite end walls and the other of said supports, said tubular output shaft including a bore therethrough, a second free end extending through said other opposite end wall exteriorly of said chamber, and a first output gear on said tubular output shaft within said chamber and between said one and other supports;

another output shaft extending through said chamber and said bore of said tubular output shaft so as to be journaled at least in said one opposite end wall and including a third free end extending exteriorly of said chamber, and a second output gear on said another output shaft within said chamber between said other support and said one opposite end wall;

a driven shaft and a driving shaft within said chamber extending through said other support and having opposite ends thereof journaled in said one opposite end wall and said one support, respectively, said driving shaft including a plurality of splines arranged between said opposite ends thereof, and a first pinion gear adjacent said one opposite end wall and meshed with said input gear on said input shaft, said driven shaft including a second pinion gear and a third pinion gear respectively arranged thereon between

said one opposite end wall and said other support, said second pinion gear being meshed with said second output gear on said another output shaft;

and

means selectively movable on said driven shaft between at least a pair of axially spaced positions thereon for effecting the transmission of the rotation of said input shaft to said tubular output shaft and said another output shaft, respectively, said transmission effecting means including a pair of interconnected stepped shifting gears, and a splined bore extending through said stepped shifting gears and receiving said splines of said plurality thereof on said driving shaft so as to be both conjointly rotatable therewith and selectively axially movable thereon between the positions of said at least pair thereof, the larger of said stepped shifting gears being meshed with said first output gear on said tubular output shaft when said stepped shifting gears are in one position of the at least pair thereof and the smaller of said shifting gears being meshed with said second output gear on said another shaft when said stepped shifting gears are in another position of the at least pair thereof.

4,476,737

ROTARY POWER TRANSMISSION

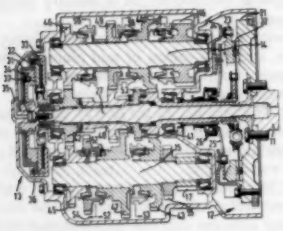
Alastair J. Young, Kenilworth, England, assignor to Automotive Products plc, Leamington Spa, England

Filed Sep. 13, 1982, Ser. No. 417,503

Claims priority, application United Kingdom, Sep. 19, 1981, 8128374

Int. Cl.³ F16H *3/08*

U.S. Cl. 74—358 **7 Claims**



1. A rotary power transmission comprising:

an input shaft;

an output shaft;

a first layshaft connected for continuous drive to said output shaft;

gear trains selectively engageable by dog clutch means between said input shaft and first layshaft;

a second layshaft connectable by dog clutch means to said output shaft;

gear trains selectively engageable by dog clutch means between said input shaft and second layshaft;

a first clutch at one side of the transmission and engageable to establish driving connection between the input shaft and output shaft through one of said gear trains;

a second clutch at the other side of the transmission and engageable to establish driving connection between the input shaft and output shaft through one other of said gear trains;

and a transfer gear train provided between said first and second layshafts and comprising:

a first gear wheel fast for rotation with one of said first and second layshafts;

a second idler gear wheel;

and a third gear wheel engageable by dog clutch means with the other of said first and second layshafts.

4,476,738

GEAR-SHIFT MECHANISM FOR POWER TRANSMISSION UNITS

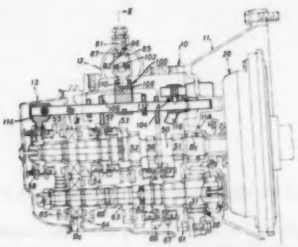
Shozi Haga, and Tadashi Nozaki, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 27, 1982, Ser. No. 412,240

Claims priority, application Japan, Sep. 4, 1981, 56-132185

Int. Cl.³ G05G *9/12, 5/10*

U.S. Cl. 74—475 **7 Claims**



1. In a gear-shift mechanism for a power transmission unit including input and output shafts supported in parallel to each other from a housing assembly for said unit, an idler shaft supported in parallel with said shafts from said housing assembly, driving and driven gears respectively mounted on said input and output shafts, an idler gear axially slidable on said idler shaft, a fork shaft slidably supported in parallel with said idler shaft from said housing assembly and being operatively connected to a manual shift lever to be selectively shifted from its neutral position to a forward or reverse position, a detent mechanism mounted on said housing assembly for selectively retaining said fork shaft in its neutral and shifted positions under a resilient load acting thereon, a shift head member slidable on said fork shaft, a one-way engagement mechanism for effecting engagement of said shift head member with said fork shaft in axial movement of said fork shaft to and away from its reverse position, and a shift arm member pivoted to the inner wall structure of said housing assembly and linked with said shift head member, and in which said idler gear is carried by said shift arm member to be retained in its neutral position and to be engaged with said driving and driven gears in the axial movement of said fork shaft to its reverse position;

the improvement wherein one of said shift arm member and said shift head member is provided with means for effecting disengagement of said idler gear from said driving and driven gears under a resilient load less than that acting on said detent mechanism when said shift head member is shifted away from its reverse position to be retained in its neutral position, and wherein at least one of said idler gear, said shift arm member and said shift head member is arranged to abut against a stationary portion in said housing assembly.

4,476,739

GEAR-SHIFT MECHANISM FOR POWER TRANSMISSION UNITS

Hajime Arai, Aichi; Shozi Haga, and Tadashi Nozaki, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 27, 1982, Ser. No. 412,280

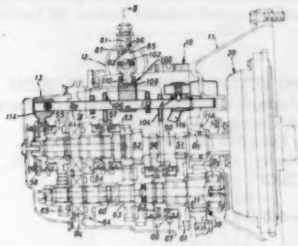
Claims priority, application Japan, Sep. 4, 1981, 56-132186[U]

Int. Cl.³ G05G *9/12, 5/10*

U.S. Cl. 74—475 **6 Claims**

1. In a gear-shift mechanism for a power transmission unit including input and output shafts supported in parallel to each other from a housing assembly for said unit, an idler shaft supported in parallel with said shafts from said housing assembly, driving and driven gears respectively mounted on said

input and output shafts, an idler gear axially slidable on said idler shaft, a fork shaft slidably supported in parallel with said idler shaft from said housing assembly and being operatively connected to a manual shift lever to be selectively shifted from its neutral position to a forward or reverse position, a detent mechanism mounted on said housing assembly for selectively retaining said fork shaft in its neutral and shifted positions under a resilient load acting thereon, a shift head member slidable on said fork shaft, a one-way engagement mechanism for effecting engagement of said shift head member with said fork shaft in axial movement of said fork shaft to and away from its reverse position, and a shift arm member pivoted to the inner wall structure of said housing assembly and linked with said shift head member, and in which said idler gear is carried by said shift arm member to be retained in its neutral



position and to be engaged with said driving and driven gears in the axial movement of said fork shaft to its reverse position;

the improvement wherein one of said shift arm member and said shift head member is provided with means for effecting disengagement of said idler gear from said driving and driven gears under a resilient load less than that acting on said detent mechanism when said shift head member is shifted away from its reverse position to be retained in its neutral position and for effecting engagement of said idler gear with said driving and driven gears under said resilient load when said shift head member is shifted to its reverse position, and wherein at least one of said idler gear, said shift arm member and said shift head member is arranged to abut against a stationary portion in said housing assembly.

4,476,740

SHIFT MECHANISM FOR CHANGE-SPEED GEAR TRANSMISSION

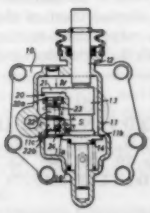
Shuichiro Ida; Shoichi Ooshima; Ichiro Horiuchi, all of Toyota, and Mitsufumi Nishu, Chiryu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan

Filed Mar. 19, 1982, Ser. No. 359,870

Claims priority, application Japan, Mar. 30, 1981, 56-44903

Int. Cl.³ F16H *57/06*

U.S. Cl. 74—476 **4 Claims**



1. In combination with a shift mechanism for a change-speed gear transmission including a manual gearshift lever arranged to be selectively shiftable toward forward speed-ratio and reverse-ratio positions at the same gate in a gearshift pattern; a selector shaft mounted within a housing assembly of said gear transmission for both axial and rotary movement and being operatively connected to said gearshift lever to be axially moved in a selecting operation of said gearshift lever toward said gate and to be rotated in a shifting operation of said gearshift lever toward one of said forward speed-ratio and reverse-ratio positions; and a movable member mounted on said selector shaft for axial and rotary movement with said selector shaft and having a radial lever arm arranged to be selectively movable for establishing a forward speed-ratio gear train in the shifting operation of said gearshift lever toward said forward speed-ratio position and for establishing a reverse-ratio gear train in the shifting operation of said gearshift lever toward said reverse-ratio position;

a safety device for said shift mechanism comprising: a radial projection integral with said movable member; a reverse restrict pin rotatable and axially slidable within a boss portion integrally formed with the inner wall of said housing assembly in parallel with said selector shaft, said restrict pin being provided at one end thereof with a recessed portion arranged to be engaged with said radial projection of said movable member in the shifting operation of said gearshift lever from said forward speed-ratio position to said reverse-ratio position across said same gate to restrict the rotary movement of said radial lever arm of said movable member; means for positioning said restrict pin in its assembled position in such a way to allow axial movement of said restrict pin in a predetermined distance; and resilient means for biasing said restrict pin toward said radial projection of said movable member and toward its assembled position.

4,476,741

TILT TYPE STEERING DEVICE

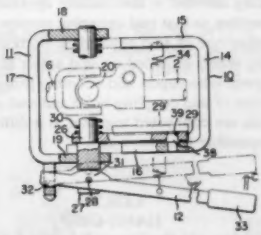
Mikio Yamaguchi, Takasaki, Japan, assignor to Nippon Seiko K.K., Tokyo, Japan

Filed Jun. 1, 1982, Ser. No. 383,495

Claims priority, application Japan, Jun. 9, 1981, 56-87459

Int. Cl.³ B62D *1/18*; G05G *5/06*

U.S. Cl. 74—493 **1 Claim**



1. A tilt type steering device comprising:

an upper shaft having a steering wheel mounted thereon;

a lower shaft connected to a steering gear;

a universal joint connecting said two shafts together;

an upper bracket provided on an upper column rotatably supporting said upper shaft, said upper bracket having side plates;

a lower bracket provided on a lower column fitted on said lower shaft and mounted to a vehicle body portion, said lower bracket having side plates partly overlapping the side plates of said upper bracket;

angle limiting means for making said upper bracket tiltable in a predetermined angle range relative to said lower bracket about the center line of said universal joint;

first biasing means for biasing said upper bracket so that said upper bracket tilts in a jumped-up tilt limit direction relative to said lower bracket;

a rod member rotatably and axially movably supported by the other portion of the side plates of one of said upper and lower brackets than said overlapping portion;

a connecting member fixed to said rod member adjacent to the side plate of the other of said upper and lower brackets, said connecting member having therein coupling holes substantially equal in diameter;

second biasing means for biasing said connecting member axially of said rod member so that said connecting member is urged toward the side plate of said other bracket;

an operating member coupled to said rod member for imparting to said rod member rotation and axial movement against said second biasing means;

selector means provided on said one bracket, said selector means being provided with a plurality of restraining portions disposed around the center of rotation of said rod member with a predetermined selected angle therebetween;

an engaging portion provided on one of said rod member and said operating member and restrained by one of said restraining portions of said selector means; and

a coupling projection provided on the side plate of said other bracket adjacent to said connecting member and capable of fitting in said coupling holes, said coupling projection being capable of fitting in one of the coupling holes of said connecting member which corresponds to one of said restraining portions which restrains said engaging portion when said operating member is operaied to move said rod member in axial direction and in rotational direction so that said engaging portion is restrained by one of said restraining portions;

whereby when said coupling projection fits in one of said coupling holes and said upper and lower columns are connected together at an inclination corresponding thereto, said operating member is operated to move said rod member axially against said second biasing means and withdraw said coupling hole of said connecting member from said coupling projection, and said upper bracket is inclined at a jumped-up tilt limit angle relative to said lower bracket by said first biasing means, whereafter said operating member is continuedly operated to rotate said rod member so that said engaging portion is restrained by any other one of said restraining portions, and then the steering wheel mounted on said upper shaft is moved up and down, whereupon said coupling projection fits in any other one of said coupling holes and said upper and lower columns are connected together at a different inclination corresponding thereto.

4,476,742

HAND GRIP

Noel H. Midgley, 361 Dandenong Rd., Armdale, Victoria 3143, Australia

PCT No. PCT/AU81/00061, § 371 Date Jan. 8, 1982, § 102(e) Date Jan. 8, 1982, PCT Pub. No. WO81/03284, PCT Pub. Date Nov. 26, 1981

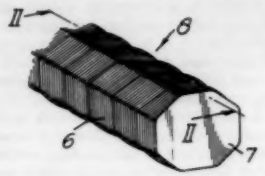
PCT Filed May 19, 1981, Ser. No. 339,444

Claims priority, application Australia, May 23, 1980, PE3698

Int. Cl.³ B62K *21/26*; B32B *3/30, 7/04*

U.S. Cl. 74—551.9 **5 Claims**

1. A hand grip on the handle portion of sporting equipment, hand tool or other article generally gripped by hand during use, having helically wound onto said handle and affixed thereto a length of tape with upper and lower surfaces provided with substantially complementary, longitudinally extending grooves and ridges such that a portion of one longitudinal edge of said tape overlaps a portion of the opposite longitudinal edge thereof, whereby grooves and ridges on the upper surface of said tape engage complementary ridges and grooves



on the lower surface of said tape, and the grooves and ridges of the upper surface extend helically around the handle portion.

4,476,743

SELECTIVE DRIVING MECHANISM

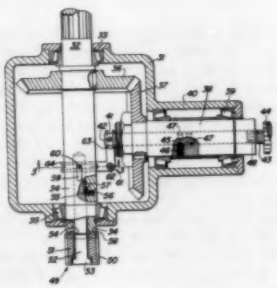
Ludwig B. Magin, Schifferstadt, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Nov. 2, 1982, Ser. No. 438,434

Claims priority, application European Pat. Off., Nov. 12, 1981, 81401788.5

Int. Cl.³ F16H *37/06, 1/14*

U.S. Cl. 74—665 GB **6 Claims**



1. A selective driving mechanism comprising:

an input shaft for drivingly connecting to a power-take-off of a vehicle and having a hollow portion with a splined end;

a driven shaft constantly driven by the input shaft and having a hollow portion with a splined end;

first and second axially slidable output shafts oriented perpendicular with respect to each other and having splined parts engageable with the splined ends of the input shaft and the driven shaft; and

a bell crank lever having first and second arms, each coupled with a respective one of the first and second output shafts so that angular displacement of the lever causes axial movement of the output shafts to couple and uncouple the output shafts with the input shaft and the driven shaft.

4,476,744

MULTI-SPEED FAN DRIVE APPARATUS

James W. Crooks, 341 N. Range Line Rd., Carmel, Ind. 46032

Filed Apr. 10, 1981, Ser. No. 252,959

Int. Cl.³ F16H *3/74*

U.S. Cl. 74—751 **27 Claims**

1. A multi-speed fan drive apparatus which comprises:

first and second sun gears, said second sun gear having more gear teeth than said first sun gear;

first mounting means for mounting said first and second sun

gears to a fixed support and independently rotatable about a common central axis;

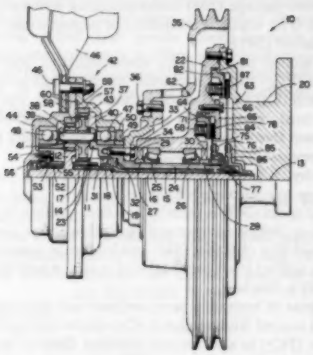
a planet gear carrier including at least a first rotatable planet gear intermeshed with said first sun gear and at least a second rotatable planet gear intermeshed with said second sun gear;

second mounting means for mounting said planet gear carrier rotatable about the central axis;

drive means for rotating said planet gear carrier;

a ring gear assembly including a ring gear intermeshed with each of the first and second planet gears;

third mounting means for mounting said ring gear assembly with the ring gear rotatable about the central axis;



a plurality of fan blades;

fourth mounting means for mounting said fan blades in driving connection with said ring gear assembly;

first rotation-limiting means for preventing said first sun gear from rotating about the central axis in a first direction relative the fixed support;

second rotation-limiting means for preventing said second sun gear from rotating about the central axis in a second direction, opposite the first direction, relative the fixed support; and

third rotation-limiting means for causing said planet gear carrier and said ring gear assembly to rotate about the central axis in unison.

4,476,745

CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION HAVING A NEUTRAL COAST AND IDLE FEATURE

Richard D. Moan, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 14, 1981, Ser. No. 301,790
Int. Cl.³ B60K *41/18, 41/16*
U.S. Cl. 74—866 **3 Claims**

1. An automatic transmission control system for a multiple ratio transmission in an automotive vehicle driveline having an internal combustion engine;

multiple ratio gearing establishing torque delivery paths between the engine and a transmission driven member;

fluid pressure operated clutches and brakes for controlling the relative motion of the gear elements to establish various operating modes, one clutch being adapted to be engaged to complete a torque delivery path during operation in serveral forward driving ratios;

a pressure source;

control pressure passages connecting the pressure source with said clutches and brakes;

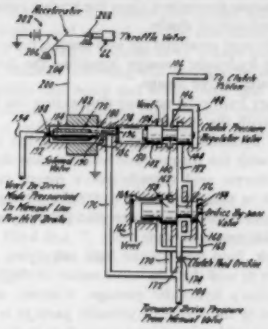
shift valves for selectively distributing pressure to said clutches and brakes to effect ratio changes;

a manual valve in said circuit for controlling distribution of pressure to said shift valves and to said clutch;

a clutch pressure regulator valve communicating with said clutch for regulating the magnitude of the pressure acting on said clutch;

driver controlled valve means for overruling the regulating action of said clutch pressure regulator valve when the engine carburetor throttle is advanced;

said control system includes an orifice bypass valve located between said manual valve and said clutch pressure regulator valve;



said orifice bypass valve including a clutch feed orifice and a clutch feed bypass passage in parallel disposition with respect to said clutch feed orifice; and

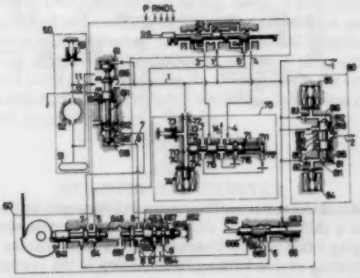
said orifice bypass valve including a shiftable valve element responsive to pressure in said clutch to selectively open and close said bypass passage in response to control pressure distributed to said clutch when said manual valve is moved from a neutral position to a clutch engaging position.

4,476,746

HYDRAULIC REGULATOR FOR A V-BELT TYPE CONTINUOUSLY VARIABLE TRANSMISSION FOR VEHICLES

Nobuaki Miki, Kariya, and Shoji Yokoyama, Anjo, both of Japan, assignors to Aisin Warner Kabushiki Kaisha, Anjo, Japan

Filed Mar. 26, 1981, Ser. No. 247,773
Claims priority, application Japan, Mar. 28, 1980, 55-40850
Int. Cl.³ F16H *55/56*; B60K *41/12*
U.S. Cl. 74—867 **5 Claims**



1. A hydraulic regulator device in a V-belt type continuously variable transmission for vehicles having an input and an output pulleys mounted respectively on an input and an output shaft and having variable effective diameters, and a V-belt drivingly connected to said input and output pulleys, wherein

the torque ratio between the input and output shafts is continuously controlled by adjusting said effective diameter of each pulley by hydraulic pressure; characterized in that said hydraulic regulator device comprises

a hydraulic pressure source,

a regulator valve means for receiving hydraulic pressure supplied by said hydraulic pressure source and supplying line pressure,

a throttle valve means, the action of said throttle valve means depending upon a throttle opening,

a torque ratio valve means, the action of said torque ratio valve means depending upon the torque ratio between the input and output shafts,

an exhaust port arranged on said torque ratio valve means,

a primary hydraulic passage inputting the line pressure to the throttle valve means,

a secondary hydraulic passage connecting the throttle valve means with the regulator valve means,

a tertiary hydraulic passage connecting the throttle valve means with the torque ratio valve means through an orifice, wherein said throttle valve means causes throttle pressure in said secondary hydraulic passage by controlling the connection between said primary and secondary hydraulic passages, and

a feedback fluid passage at least supplying said throttle pressure to said throttle valve means through an orifice of said tertiary hydraulic passage, wherein said hydraulic pressure of the tertiary hydraulic passage is led and controlled to said exhaust port according to the torque ratio, said regulator valve means is controlled by changing stepwisely the throttle pressure, and the resultant stepwised line pressure depends on the torque ratio.

4,476,747

TIMING CONTROL VALVE IN AUTOMATIC TRANSMISSION CONTROL APPARATUS

Mutsumi Kawamoto, Nagoya, Japan, assignor to Aisin Warner Kabushiki Kaisha, Aichi, Japan

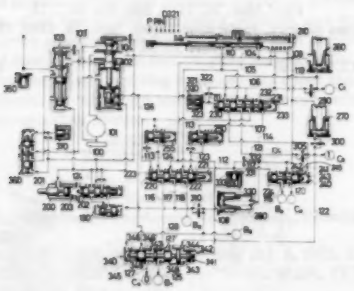
PCT No. PCT/JP80/00097, § 371 Date Jan. 9, 1981, § 102(e) Date Jan. 9, 1981

PCT Filed May 8, 1980, Ser. No. 229,568

Claims priority, application Japan, May 10, 1979, 54-57735

Int. Cl.³ B60K *41/16*

U.S. Cl. 74—869 **20 Claims**



1. An automatic transmission control apparatus of the type in which a shifting to one shift range is provided essentially by engaging a first friction clutch (C_1) and a friction brake (B_1) for effectuating engine braking or for aiding in the operation of a one-way clutch, said automatic transmission control apparatus including a timing control valve (**340**) functioning in a manner such that a shifting from a higher speed shift range to said one shift range is effectuated by causing said friction brake (B_1) to be engaged after releasing a second friction clutch (C_2) which has been in engagement at said higher speed shift range and causing said one-way clutch, if any, to be engaged, said timing control valve (**340**) comprising:

(a) a spool (**347**);

(b) a spring (**345**) biasing said spool (**347**) in a first direction;

(c) a first chamber (**341**) having a pressure-applicable area A_1 to which hydraulic line pressure (PL) may be supplied to bias said spool (**347**) in the direction counteracting the biasing force of said spring (**345**);

(d) a second chamber (**344**) having a pressure-applicable area A_2 to which hydraulic pressure (PC_2) from said second friction clutch (C_2) may be supplied to bias said spool (**347**) in the direction counteracting the biasing force of said spring (**345**);

(e) a third chamber (**348**) for controlling supply and release of hydraulic pressure for said friction brake (B_1);

(f) a first passage (**108**) communicating hydraulic line pressure (PL) which is a function of engine speed to said first chamber (**341**);

(g) a second passage (**122**) communicating hydraulic pressure (PC_2) from a hydraulic servo of said second friction clutch (C_2) to said second chamber (**344**); and

(h) a third passage (**116**) communicating hydraulic pressure to said third chamber (**348**) when said spring (**345**) is not compressed;

whereby, when it is desired to shift from a higher speed range to said one shift range:

(i) said spool (**347**) is initially in a first position in which said spring (**345**) is compressed by hydraulic line pressure (PL) in said first chamber (**341**) and hydraulic pressure (PC_2) in said second chamber (**344**) and in which said third passage (**116**) is blocked;

(j) release of hydraulic pressure from said hydraulic servo of said second friction clutch (C_2) allows the hydraulic pressure (PC_2) in said second chamber (**344**) to begin gradually reducing; and

(k) when the hydraulic pressure (PC_2) in said second chamber (**344**) has reduced sufficiently so that the biasing force of said spring (**345**) exceeds the combined force exerted on said spool (**347**) by the hydraulic pressure in said first (**341**) and second (**344**) chambers, said spool (**347**) moves to a second position in which said third passage (**116**) communicates with said friction brake (B_1), the point at which the movement of said spool (**347**) occurs being a function of the pressure in said first chamber (**341**) and thus of engine speed;

4,476,748

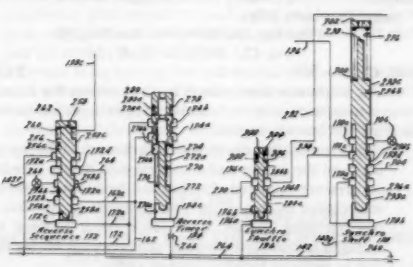
PRESELECT SHIFT CONTROL

Timothy J. Morscheck, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 16, 1981, Ser. No. 331,392

Int. Cl.³ B60K *41/10*; F16H *3/08, 5/46*

U.S. Cl. 74—867 **9 Claims**



8. In a powershift, preselect transmission of the type including a plurality of power paths alternately, connectable between input and output shafts by an automatic control system operative to effect preselective engagement of ones of synchronizer

clutches associated with each of a plurality of forward speed ratio gears in each path and then operative to effect alternate engagement of a powershift clutch associated with each path to complete driving connections between the shafts, the improvement comprising:

shift selector means including means moveable between forward, neutral, and reverse positions;

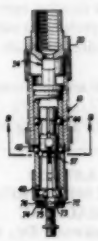
powershift means operative in response to said shift selector forward position to effect said alternate engagements completing said driving connections in response to first predetermined amounts of increased and decreased output shaft speeds;

synchro shift means operative at any given time to effect said preselective engagements of ones of the synchronizer clutches in each path independent of said shift selector position, said synchro shift means including means responsive to second predetermined amounts of increased and decreased output shaft speeds spaced between said first predetermined amounts to effect said preselective engagements of the synchronizer clutch associated with the next upshift or downshift ratio gear in a nondrivingly connected path.

4,476,749
AUTOMATIC STUD DRIVER

John A. McKean, Fairview, Pa., assignor to Titan Tool Company, Fairview, Pa.

Continuation of Ser. No. 405,365, Aug. 5, 1982, abandoned, which is a continuation of Ser. No. 179,444, Aug. 19, 1980, abandoned. This application Feb. 14, 1984, Ser. No. 579,288
Int. Cl.³ B25B *19/00*
U.S. Cl. 81—53.2 5 Claims



1. A stud driving device comprising:

a cylindrical hollow body having a longitudinal axis, said body having a stepped inner peripheral surface, an inside diameter of a first portion of said stepped inner peripheral surface being greater than an inside diameter of a second portion of said inner peripheral surface;

a rotatably and reciprocally driven head;

a cylindrical carriage with a peripheral wall, said carriage being partially inside of said body and being axially slidable and rotatable with respect to said body, said carriage being rotatably driven by said driven head;

a plurality of jaws enclosed by said carriage, said jaws having a stud gripping means, said plurality of jaws being arranged in a cylindrical shape of substantially the same diameter as the inside diameter of the peripheral wall of said carriage, each of said jaws being provided with a first groove oriented in a plane generally perpendicular to the longitudinal axis of the body, the first groove on one jaw being adjacent to a similar first groove on another jaw;

means to open and close said jaws on a stud, said plurality of jaws having an open and a closed position;

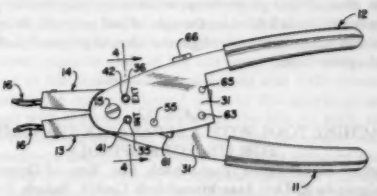
a plurality of latching balls held in the peripheral wall of said carriage in contact with the jaws and one of said first and second portions of said inner peripheral surface of said body, said latching balls extending past the inside surface of said peripheral wall of said carriage when said latching balls are in contact with said second portion of said inner peripheral surface of said body, said carriage being axially slidable from said first portion to said second portion of said inner peripheral surface of said body with said jaws in a closed position when said latching balls align with said first groove on said jaws;

the improvement comprising a cut on a side edge of each of said jaws, said cut being oriented generally parallel to said longitudinal axis of said body and being adjacent a similar cut on another of said jaws, said pair of cuts defining an axially oriented second groove between said jaws for holding one of said latching balls, each cut being of a size and axial length so that, when one of said latching balls is located within said second groove, the radially outermost portion of said ball is located at or within the wall of the carriage, thereby allowing the carriage to be axially inserted within said body and move from said first portion to said second portion of said stepped inner peripheral surface of said body with said jaws in the open position.

4,476,750
LATCHING MECHANISM

James W. Murphy, 1001 Skylark Dr., Denton, Tex. 76201

Filed Jun. 7, 1983, Ser. No. 501,927
Int. Cl.³ B23P *19/04*
U.S. Cl. 81—300 13 Claims



10. A latching mechanism for use with an internal member and a pair of relatively movable external members disposed on opposite sides of said internal member, for latching alternately one or the other of said external members to said internal member, comprising

said internal member having a transverse generally cylindrical bore provided with an elongated recess in one wall;

said external members each having a generally cylindrical hole for selective alignment with said cylindrical bore, and having the same diameter as said cylindrical bore;

an elongated cylindrical latch pin slidably disposed in said bore, having an external annular groove intermediate its ends;

a generally C-shaped circular spring, having a tangential tab, configured to be disposed in said latch pin annular groove with its tab projecting therefrom into said longitudinal recess of said bore for slidable engagement therewith;

and said latch pin having a length to extend into the hole of one selected external member while remaining clear of the other external member.

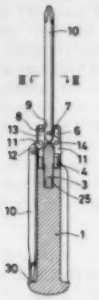
4,476,751
MULTIPLE SCREWDRIVER

Yoshiaki Mishima, 68, 1-chome, Higashikoma, Ikoma-shi, Nara, Japan

Filed Aug. 30, 1983, Ser. No. 527,732
Int. Cl.³ B25G *1/08*
U.S. Cl. 81—440 5 Claims

1. A multiple screwdriver comprises a grip having a support at one end thereof, a plurality of bits coupled at one end thereof to said support, said support being formed with as many axial slits as said bits so as to extend downwardly from its top and with a center hole communicating with said slits to receive said

each bit, said each slit having on its opposing walls a pair of axial guide grooves which have a shoulder adjacent to its upper end, each of said bits being formed at its coupled end with a coupling plate having a slant portion and a straight portion parallel with the axis of said bit, said coupling plate being formed on each side thereof with a projection, said



coupling plate of said each bit being adapted to fit in said slit with said projections in said guide grooves, whereby said each bit is axially slidable along said axial guide grooves and pivotable around said projections between its inoperative position where said bit is folded on the side of said grip and its operative position where said bit is aligned with said grip and pushed into said center hole.

4,476,752

MACHINE TOOL WITH A SEPARABLE TRANSMISSION FOR ITS WORK SPINDLE

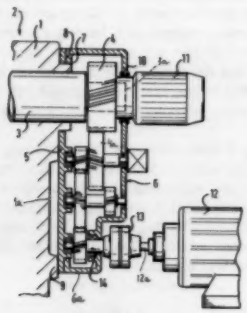
Norbert Hessbrüggen, Eschenbach, Fed. Rep. of Germany, assignor to EMAG Maschinenfabrik GmbH, Salach, Fed. Rep. of Germany

Filed Jun. 14, 1982, Ser. No. 388,141

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1981, 3123639

Int. Cl.³ B23B *19/02*

U.S. Cl. 82—28 R **9 Claims**



1. In a machine tool, particularly in a lathe, the combination of a housing; a rotary torque receiving member installed in and having a portion extending from said housing; a prime mover; and a transmission including a case removably mounted on said housing, an input element mounted in said case and receiving torque from said prime mover, a rotary first toothed member removably mounted on said portion of said torque receiving member externally of said housing, and a second toothed member receiving motion from said input element and meshing with said first toothed member, said housing having means for locating said case in a predetermined position and said case having an opening which receives at least a portion of said locating means and has a diameter greater than said portion of said torque receiving member.

4,476,753

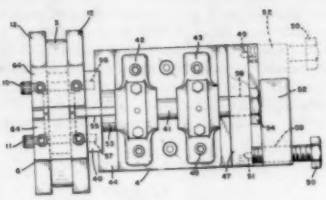
CUT CORE APPARATUS

Hsin L. Li, Parsippany; John D. Misson, Rumson, and David G. Carrigan, Oak Ridge, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 9, 1982, Ser. No. 406,664

Int. Cl.³ B26D *1/00*

U.S. Cl. 83—36 **5 Claims**



1. A method for cutting a magnetic core composed of glassy metal alloy, comprising the steps of:

(a) mounting said core having at least one portion appointed to be cut onto a mandrel;

(b) applying to the outside peripheral surface of said core portion a compressive clamping force directed toward said surface and normal thereto with a rigid strip, which extends over the core portion appointed to be cut and is clamped against said peripheral surface;

(c) positioning said mandrel to locate and fix said core onto an indexing means;

(d) indexing said mandrel and said core to a preselected fixed position; and

(e) cutting said core with a cutting means.

4,476,754

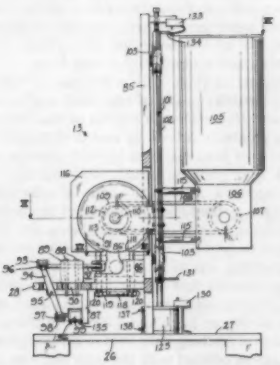
AUTOMATIC CABLE MEASURING AND CUTTING MACHINE

Lucien C. Ducret, 28 Lockwood Dr., Old Greenwich, Conn. 06870

Filed Dec. 7, 1981, Ser. No. 327,939

Int. Cl.³ B23D *45/02*; B26D *5/40, 7/18*

U.S. Cl. 83—150 **1 Claim**



1. An automatic cable measuring and cutting machine comprising:

means for supplying a continuous length of cable to be cut,

a circular saw adapted to sever from the continuous length of cable a predetermined shorter length of cable,

a cable feeding means adapted to receive cable from the supplying means and transport the cable to the saw,

a channeled anvil located adjacent the saw and provided with a slot to permit passage of the saw blade, a vise assembly for holding a cable against the anvil,

a slot filler movable into and out of the slot in the anvil, whereby debris from a cable cutting operation may be removed from said slot, driving means for actuating the saw and the cable feeding means, means for causing actuation of the saw, and means for causing actuation of the cable feeding means.

4,476,755

DEVICE AT AUTOMATIC MARKING OF CONTINUOUSLY ADVANCED TREE STEMS

Jan Erik Hedin, Alfta, Sweden, assignor to OSA AB, Alfta, Sweden

Filed Dec. 6, 1982, Ser. No. 446,872
Claims priority, application Sweden, Dec. 17, 1981, 8107590
Int. Cl.³ B27B *1/00*, *7/02*
U.S. Cl. 83—364 5 Claims

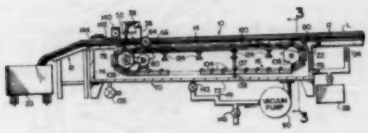
1. A device for preventing/length measuring errors resulting from accidentally remaining local offshoots from a portion of the butt end of a tree stem continuously advanced, with the butt end first, towards periodically actuated cross-cutting member for cutting the stem in predetermined length sections, a measuring instrument positioned downstream of said member and including a measuring wheel being arranged to roll along the stem and continuously register the stem length to periodically emit a cutting impulse to said cross-cutting member for actuating the same when said length section has been passed through, a stationary detector, acting horizontally in the transverse direction of the stem path, being provided downstream of said cross-cutting member to sense the entering of the butt end and then to emit an actuating signal to the starting means for said measuring instrument, characterized in that a second stationary detector is positioned in a spaced relation to the first stationary detector for acting in parallel therewith, the positions of the first and second detectors being symmetrical with respect to the center line of the stem path, and their spacing not exceeding a predetermined minimum butt diameter for a stem classified as saw timber, the first and second detectors being associated to said starting means for the measuring instrument such that signals from both detectors are required to actuate said starting means.

4,476,756

APPARATUS FOR WORKING LIMP SHEET MATERIAL ON A CONVEYOR

David R. Pearl, and Lawrence S. Wolfson, both of West Hartford, Conn., assignors to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Apr. 12, 1982, Ser. No. 367,431
Int. Cl.³ D06H *7/00*
U.S. Cl. 83—422 15 Claims



1. A machine for working on limp sheet material comprising:

a conveyor table including an endless, air-permeable conveyor belt for moving a layup of limp sheet material between one end of the table and the other and defining a work support surface for holding the sheet material during movement and working, the table also having a vacuum chamber generally enveloping the conveyor except for the portion of the belt defining the support surface on which the layup of sheet material is held and communicating with the layup on the support surface of the belt, the vacuum chamber including an enclosure having a bottom wall disposed under the conveyor, two end walls located adjacent opposite ends of the conveyor respectively and joined to the bottom wall, two lateral side walls located adjacent the opposite lateral sides of the conveyor and joined with the two end walls and the bottom wall, and two aprons joined to the upper portions of the end walls respectively and the two lateral side walls adjacent each end wall to form a closed, rectangular container exposing the work support surface of the conveyor belt between the aprons;

vacuum generating means connected with the vacuum chamber for evacuating the chamber and the layup of sheet material on the support surface of the conveyor belt, and

sealing means between the lateral walls of the vacuum chamber enveloping the conveyor belt and the layup of sheet material on the belt, the sealing means including an air-impermeable overlay covering the layup and the exposed portions of the air-permeable conveyor belt between the layup and an air-impermeable member extending along each lateral edge of the belt, and a sliding seal disposed between the upper portions of the lateral side walls of the chamber and the air-impermeable member at the upper run of the belt to seal the vacuum chamber and at the same time permit relative movement between the vacuum chamber and the movable layup and conveyor belt.

4,476,757

ADJUSTABLE FEATHERBOARD

David S. Morris, Columbia, Mo., assignor to Shopsmith, Inc., Dayton, Ohio

Filed Sep. 2, 1982, Ser. No. 414,134
Int. Cl.³ B26D *7/06*
U.S. Cl. 83—446 20 Claims

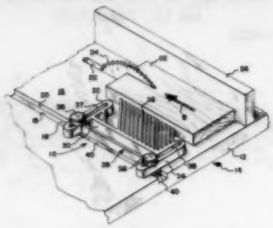
1. For use with a table saw of the type which includes a substantially flat saw table having at least one groove formed in its surface and a blade slot extending through the table adjacent and parallel to said groove, a featherboard comprising:

a body having a plurality of angularly extending elongated fingers and at least a first transverse slot formed therethrough;

mounting bolt means positioned in said first slot and having

a threaded shank, a flared lower end, and means threadedly engaging an upper end of said shank; and

an expansion bar extending beneath said slot and sized to slidably engage a groove in a saw table and having a first elongate bore formed therethrough receiving said flared



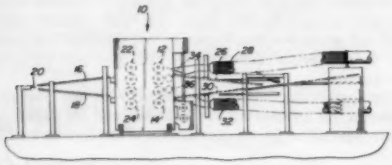
end, whereby rotation of said engaging means clamps said body to said bar and draws said flared end upwardly in said bore such that said flared end expands said bar transversely against walls of an associated groove to lock said bar thereagainst.

4,476,758

AUTOMATIC SLITTER SCORER WITH WEB SUPPORT

Robert E. Coburn, Warminster, Pa., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Sep. 4, 1981, Ser. No. 299,354
Int. Cl.[3] B26D *3/08, 11/00*
U.S. Cl. 83—479 8 Claims



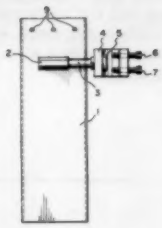
1. A bi-level slitter scorer system for operating on a moving web of mill run corrugated paperboard comprising means for shearing the web transversely into a leading portion and a trailing portion, means downstream from said shearing means for selectively guiding the moving web to either the upper level of a slitter scorer or the lower level of a slitter socrer, a slitter scorer adjacent said guiding means for receiving a web therefrom, said slitter scorer having at least one pair of shafts defining an upper web path and at least one pair of shafts defining a lower web path, at least one pair of tools on each of said pairs of shafts for operating on a web, an upper support table downstream from said slitter scorer for supporting a web traveling along the upper web path, a lower support table down-supporting a web traveling along said lower web path, means upstream of the leading edge of said upper support table for flattening the center portion of a web traveling on the upper web path to prevent the web center portion from sagging, means upstream of the leading edge of said lower table for flattening the center portion of a web traveling on said lower web path to prevent upward bowing of the web center portion, means for reciprocating said upper flattening means relative to the upper web path, means for reciprocating said lower flattening means relative to the lower web path, and actuating means associated with said upper and said lower flattening means for reciprocating the same as a unit whereby one flattening means is in an operative position while the other is in an inoperative position.

4,476,759

PORTABLE CHAINSAW MILLING GUIDE ATTACHMENT

Stephen E. Aderneck, Box 188, Quathiaski Cove, B.C., Canada V0P-1N0

Filed Mar. 3, 1982, Ser. No. 318,432
Int. Cl.[3] B27B *17/00*
U.S. Cl. 83—574 1 Claim



1. A portable chain saw milling guide attachment comprising:

a rigid channel-shaped guide having a flat section with two downturned flanges along opposite side edges of said flat section;

dog teeth formed on the underside of said flat section between the flanges;

an internally threaded member fixed to the top side of said flation section extending traversly to said flanges;

a threaded shaft having one end threadedly engaged in said internal threaded member;

a U-shaped clamp attached to the other end of said threaded shaft, said clamp having a serrated backing plate attached to the inside wall of one leg of the U-shaped clamp and threaded holes in the opposite leg of the U-shaped clamp;

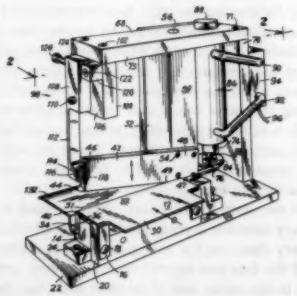
screws threaded through said threaded hole cooperating with the backing plate for holding the guide bar of a chain saw in the clamp and on the attachment.

4,476,760

CUTTING SYSTEM

Charles Block, North Bellmore, and Leon Mintz, Syosset, both of N.Y., assignors to Joseph Galkin Corporation, Hicksville, N.Y.

Filed Feb. 18, 1983, Ser. No. 468,001
Int. Cl.[3] B26D *5/08*
U.S. Cl. 83—582 8 Claims



1. A cloth cutting apparatus, in combination, comprising:

a stationary lower blade supported upon a base platform and having a first horizontal cutting edge,

an upper blade associated with said lower blade having a

free end and a connected end and having a second cutting edge disposed at an angle relative to said lower blade,

drive means including pivot means mounted upon said base platform, said drive means being for mounting said connected end of said upper blade and being vertically movable on and rotationally movable about said pivot means,

said upper blade being vertically movable between upper and lower positions and simultaneously tangentially rotatable about said pivot means between first and second rotational positions respectively,

wherein in said upper and first rotational positions, said first and second cutting edges are in cutting contact at a point at said connected end and said second cutting edge is spaced above and disposed past a vertical plane extending from said first cutting edge at said free end, and

means for moving said drive means along with said upper blade between said upper and lower positions, and

means for pressuring said free end portion of said upper blade against the tangential rotation of said upper blade during movement of said upper blade between said upper and first positions and said lower and second positions,

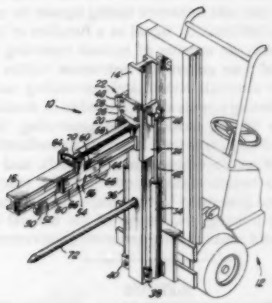
whereby the second cutting edge is pressured against the first cutting edge at the cutting point during the descent of the second cutting edge from the upper to lower position.

4,476,761

PAPER ROLL SPLITTER ATTACHMENT FOR FORK LIFT TRUCK

Perry L. Bird, Pasadena, Tex., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 21, 1982, Ser. No. 435,762
Int. Cl.³ B26D *5/04, 7/01*
U.S. Cl. 83—614 **7 Claims**



1. A paper roll splitter device including a supported and guided blade for attachment to a fork lift type truck, comprising:

generally vertically disposed means to vertically guide and support including means to be secured to a vertically movable part of the truck for vertical movement;

generally horizontally disposed means to horizontally guide and support connected to and vertically guided and supported by the vertically disposed means to vertically guide and support so as to allow substantially vertical movement of the horizontally disposed means to horizontally guide and support;

a blade connected to the horizontally disposed means to horizontally guide and support so as to allow substantially horizontal back and forth movement of the blade; and

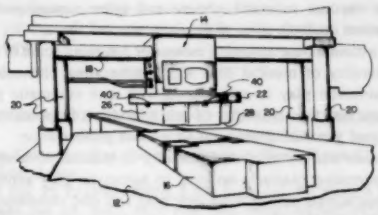
means for supporting a roll adjacent the blade secured to the device.

4,476,762

CUTTING DIE SUPPORTING PLATE APPARATUS

Frank T. Anderson, III, 8526 International Ave., Canoga Park, Calif. 91304, and Darold Kaiser, 21711 Birch Hill Dr., Diamond Bar, Calif. 91765

Filed Jan. 18, 1982, Ser. No. 340,233
Int. Cl.³ B26F *1/40*
U.S. Cl. 83—640 **5 Claims**



1. In combination with an envelope cutting machine having a working platform upon which is to be located a stack of sheet paper, a die support station, said die support station being movable toward and away from said working platform, a die support plate connected to said die support station, a cutting die mounted on said die support plate, the improvement comprising:

magnet holding means included within said die support plate, said means included within said die support plate, said magnet holding means for connecting with and supporting said cutting die; and

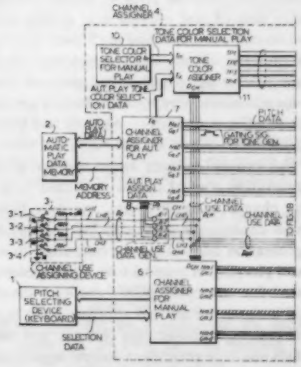
separation means mounted within said die supporting plate, said separation means being movable to permit separating of said cutting die from said die supporting plate in order to change said cutting die.

4,476,763

ELECTRONIC MUSICAL INSTRUMENT

Masaru Uya, Kadoma, and Kinji Kawamoto, Yahata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 138,516, Apr. 9, 1980, Pat. No. 4,355,559. This application Apr. 28, 1982, Ser. No. 372,728
Claims priority, application Japan, Apr. 12, 1979, 54-44919
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **10 Claims**



1. An electronic musical instrument having a plurality of musical tone signal generating channels for generating tones and comprising:

an automatic play means having a memory for controlling the tone generation of said plurality of musical tone signal generating channels on the basis of automatic play data recorded in said memory so as to successively and automatically generate musical tones;

a manual play means having a keyboard and other manual performance controls for controlling the tone generation of said plurality of musical tone signal generating channels in response to said keyboard and other manual performance controls so as to generate musical tones;

and a channel-use assigning means for assigning some of said plurality of musical tone signal generating channels to automatic play in accordance with said automatic play data and the remainder of said plurality of musical tone signal generating channels to manual performance;

wherein said some of said plurality of musical tone signal generating channels assigned to automatic play generate tone signals during automatic play and said remainder of said plurality of musical tone signal generating channels generate tone signal during manual performance;

further comprising a channel assigner means which, along with having means for controlling the tone generation, based on said automatic play data, of the musical tone signal generating channels assigned for automatic play use by said automatic play means and controlled by said channel-use assigning means, also has means which enable the control of tone generation, based on play data generated by said manual play means, of the musical tone signal generating channels assigned for manual play use and controlled by said channel-use assigning means;

wherein said channel assigner means comprises:

(a) an automatic play channel assigner means for reading and decoding said automatic play data recorded in said memory and for outputting pitch data and tone generation control signals corresponding to said musical tone signal generating channels assigned for automatic play use and for outputting said automatic play assigning channel data which indicates which of the musical tone signal generating channels are assigned for automatic play use;

(b) a channel-use data generator which, based on assignment data from said channel-use assigning means and said automatic play assigning channel data, outputs channel-use data indicating which of said plurality of musical tone signal generating channels can be used for automatic play;

(c) a manual play channel assigner means which, based on said play data of said manual play means, outputs tone generation control signals and pitch data which is assigned to said plurality of tone signal generating channels other than those tone signal generating channels indicated as being for automatic play by said channel-use data; and

(d) a data supplier means which receives said pitch data and tone generation control signals outputted from said automatic play channel assigner means and said pitch data and tone generation control signals outputted from said manual play channel assigner means, and then, in accordance with said channel-use data, matches said pitch data and tone generation control signals outputted in accordance with said plurality of musical tone signal generating channels used for automatic play from said automatic play channel assigner means and supplies them to respective musical tone signal generating channels and matches said pitch data and tone generation control signals outputted in accordance with said plurality of musical tone signal generating channels used for manual play from said manual play channel assigner means and supplies them to respective musical tone signal generating channels.

4,476,764

AUTOMATIC PERFORMANCE APPARATUS FOR USE IN COMBINATION WITH A MANUALLY OPERABLE MUSICAL TONE GENERATING INSTRUMENT

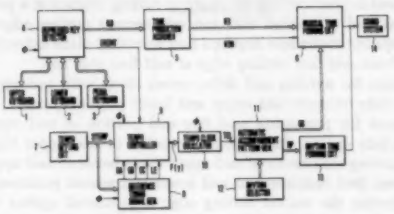
Tetsuo Nishimoto, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Aug. 19, 1982, Ser. No. 409,737

Claims priority, application Japan, Sep. 4, 1981, 56-138343

Int. Cl.³ G10F 1/00

U.S. Cl. 84—1.03 5 Claims



1. An automatic performance apparatus for use in combination with a manually operable musical tone generating instrument comprising:

a tempo setting circuit for generating a tempo information signal in response to a manually selected tempo;

a tempo signal generator for generating a tempo signal in response to said tempo information signal;

automatic performance tone forming circuit means for generating automatic performance tones in response to said tempo signal;

reference timing signal generator means responsive to a signal indicative of said selected tempo for generating reference timing signals; and

tempo controller means responsive to said tempo information signal and said reference timing signals for modifying said tempo information signal as a function of the difference between the number of manual operating events of said musical tone generating instrument within predetermined time intervals immediately preceding each of said reference timing signals and the number of manual operating events of the musical tone generating instrument within predetermined time intervals immediately following each of said reference timing signals, said modified tempo information signal controlling the tempo of the tempo signal generated by the tempo signals generator in a direction towards the tempo of the manual operating events of said musical tone generating instrument.

4,476,765

ELECTRONIC MUSIC SIGNAL GENERATOR

Hanspeter Hentzschel, Munich, and Hermann Hainzlmaier, Rottenegg, both of Fed. Rep. of Germany, assignors to Eurosil Electronic GmbH, Eching, Fed. Rep. of Germany

Filed May 25, 1983, Ser. No. 498,086

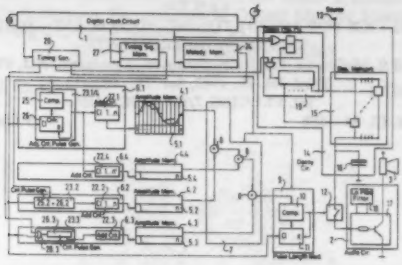
Claims priority, application Fed. Rep. of Germany, May 26, 1982, 3219731; Oct. 29, 1982, 3240084

Int. Cl.³ G10F 1/00

U.S. Cl. 84—1.03 10 Claims

1. An electronic music signal generator which supplies music signals to an audio circuit under the control of a time dependent signal control circuit, including a clock circuit, through a melody memory containing a sequential sound signal program, with an amplitude memory arrangement for storing discrete digital amplitude values for a period of a complex wave having a fundamental wave and harmonic waves, which amplitude values can be read out at a selectable cycle frequency and after summing are conducted to a digital to analog converter, characterized in that in the amplitude memory arrangement along with one amplitude memory for an actual

sound a second amplitude memory is provided having a memory content substantially corresponding to that of the first amplitude memory, in that the second amplitude memory



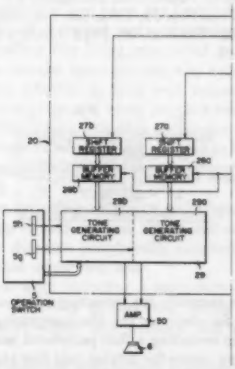
during the reading out of the actual sound is read out by a cycle frequency corresponding to the cycle frequency used in the reading out of the previous actual sound, and in that a pulse length modulator is provided as the digital to analog converter.

4,476,766

ELECTRONIC MUSICAL INSTRUMENT WITH MEANS FOR GENERATING ACCOMPANIMENT AND MELODY SOUNDS WITH DIFFERENT TONE COLORS

Hiroshi Ishii, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 445,428, Nov. 30, 1982, abandoned, which is a continuation of Ser. No. 231,133, Feb. 3, 1981, abandoned. This application Jan. 5, 1984, Ser. No. 568,283
Claims priority, application Japan, Feb. 4, 1980, 55-12193
Int. Cl.³ G10H *1/06, 1/36, 7/00*
U.S. Cl. 84—1.03 **16 Claims**



1. An electronic keyboard musical instrument comprising:

a keyboard having a plurality of performance keys, each of said performance keys being associated with a musical tone of a given pitch;

memory means for storing successive musical pitch codes in successive address areas, said successive musical pitch codes representing a musical piece;

control means coupled to said keyboard and including:

function setting means for dividing said performance keys of said keyboard in a plurality of groups as pitch code reading instruction keys; and

means coupled to said function setting means for addressing said memory means successively in accordance with operations of said performance keys set as said pitch code reading instruction keys so as to read out the successive musical pitch codes from said memory means;

tone color setting means coupled to said control means for setting different tone colors for tones to be generated by the operations of respective groups of pitch code reading instruction keys; and

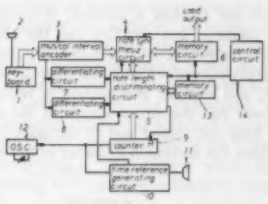
tone generating means coupled to said control means and to said tone color setting means for generating tones having tone colors set by said tone color setting means, and pitches of said generated tones being determined by the read-out successive musical pitch codes, and not by the pitches of the operated pitch code reading instruction keys.

4,476,767

KEYBOARD INPUT CODING DEVICE AND MUSICAL NOTE DISPLAYING DEVICE

Ritsu Katsuoka, Ena, Japan, assignor to Ricoh Watch Co., Ltd., Aichi, Japan

PCT No. PCT/JP81/00336, § 371 Date Jul. 19, 1982, § 102(e) Date Jul. 19, 1982, PCT Pub. No. WO82/01783, PCT Pub. Date May 27, 1982
PCT Filed Nov. 17, 1981, Ser. No. 403,633
Claims priority, application Japan, Nov. 20, 1980, 55-162601
Int. Cl.³ G09B *15/00*; G10F *5/00*
U.S. Cl. 84—115 **10 Claims**



1. An electronic musical instrument comprising a keyboard means for generating the keyboard signals by means of keying operation,

a musical interval code producing means for producing the musical interval codes based on the keyboard signals from the said keyboard means,

a detecting means for detecting rise and fall states of the said keyboard signals,

a counting means for counting ON and OFF duration of the said keyboard signals and outputting counting data,

a memory means of data for note-length coding for memorizing predetermined comparing data and triplet discriminating data,

a note-length discriminating means for receiving said counting data based on signals from the said detecting means and coding the said counting data according to said comparing data in the said memory means and correcting the data according to the said triplet discriminating data taken in sequence and thus providing note-length data for discriminating the note-length of the notes having possibility of a triplet, and

a controlling means for controlling the said memory means and note-length discriminating means.

4,476,768

DRUMSTICK

Ward L. Willis, P.O. Box 95, Breinigsville, Pa. 18031

Filed Sep. 20, 1982, Ser. No. 419,985
Int. Cl.³ G10D *13/02*
U.S. Cl. 84—422 S **1 Claim**

1. A drumstick of the type used by a musician for playing a percussion instrument such as a drum being of a unitary elon-

gated body having a generally circular cross-section with a first or striking end sharply tapered to a slightly rounded point and a second end terminating in a plane generally perpendicular to the longitudinal axis of the drumstick and intermediate the first and second ends a portion of the drumstick body being of reduced diameter and of a concave cylindrical shape to facilitate holding of the stick for playing, said reduced diameter portion being spaced from said second end according to the

weight of the finished drumstick; between said portion of reduced diameter and said first end the entire length of the stick is gradually tapered to a diameter at the point where the tip is sharply curved which is less than the largest diameter of the stick; and between said portion of reduced diameter and said second end the entire length of the stick is gradually tapered with the second end of the stick having a diameter smaller than the maximum diameter of the stick.

4,476,769

KEYBOARD APPARATUS IN ELECTRONIC MUSICAL INSTRUMENT

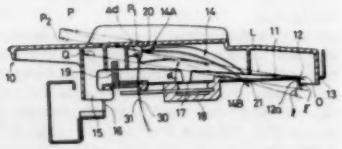
Shinji Kumano, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 3, 1982, Ser. No. 446,491

Claims priority, application Japan, Dec. 9, 1981, 56-196944; Dec. 9, 1981, 56-196945; Dec. 9, 1981, 56-182191[U]; May 22, 1982, 57-86885

Int. Cl.³ G10C *3/12*

U.S. Cl. 84—434 **26 Claims**



1. A keyboard apparatus for an electronic musical instrument, comprising:

keys arranged on a keyboard frame for vertical pivotal movement, and

a return spring for each of said keys for normally imparting to the key a returning habit, having one end anchored at a spring-anchoring portion provided on said key and having the other end anchored at a spring-anchoring portion provided on said keyboard frame, and wherein:

said return spring is elastically mounted between said keyboard frame and said key in a buckling-deformed state by its being compressed longitudinally between said spring-anchoring portions.

4,476,770

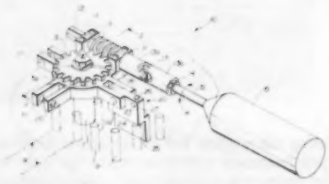
DEVICE FOR MICRO TUNING PIANOS AND OTHER STRINGED INSTRUMENTS

Neil S. McGowan, 458 Rutherford Ave., Lyndhurst, N.J. 07071

Filed Jul. 28, 1982, Ser. No. 402,413

Int. Cl.³ G10G *7/00*; G10C *3/10*

U.S. Cl. 84—458 **9 Claims**



1. A device for micro tuning stringed instruments, comprising, in combination, socket means for removably receiving pegs of said instruments, bearing surface support means including a body having said socket means supported thereby, and rotating means disposed thereabove, and at least one pair of radially extending ears rotatably supporting a bearing support plate adapted to abut against and be constrained by pegs adjacent to the peg being tuned.

4,476,771

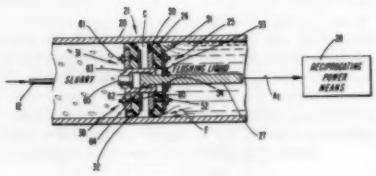
SELF-FLUSHING PISTON ASSEMBLY FOR SLURRY PUMP

David T. Kao, Lexington, Ky., assignor to University of Kentucky Research Foundation, Lexington, Ky.

Filed Sep. 30, 1982, Ser. No. 432,411

Int. Cl.³ F15B *21/04*; F01B *31/00*; F16J *9/00*

U.S. Cl. 92—78 **8 Claims**



1. A piston assembly for mounting in a mating cylinder to form a pump for slurry or the like comprising

a first piston including a first peripheral sealing member,

reciprocating means for driving said first piston for pumping action within the cylinder,

a second piston adjacent said first piston and including a second peripheral sealing member, said second piston forming an enclosed chamber with said first piston and the adjacent portion of said cylinder,

means for coupling said second piston to said reciprocating means to provide limited lost motion, and vary the size of said chamber,

means for injecting flushing liquid into said chamber during the return stroke of the piston assembly and expansion of said chamber,

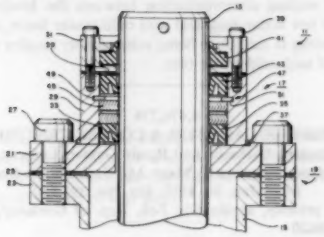
whereby on the power stroke of the piston assembly said flushing liquid is forced past the second sealing member by contraction of said chamber and into the slurry to remove slurry particles around the periphery of said second sealing member.

4,476,772

CAGING SEAL FOR HYDRAULIC ELEVATOR OR THE LIKE

Gerald W. Gorman, Cedar Hill, Tex., and Walter J. Herrmann, Plumsteadville, Pa., assignors to Corbett Elevator Manufacturing Co., Inc., Plumsteadville, Pa.

Filed Nov. 4, 1982, Ser. No. 439,065
Int. Cl.³ F16J 15/18
U.S. Cl. 92—168 2 Claims



1. In a sealing combination for sealing intermediate a cap ring of a hydraulic cylinder assembly or the like and a rod running concentrically therethrough, including:

said rod adapted to move longitudinally of said cylinder assembly responsive to hydraulic pressure applied to a piston attached to said rod and traversing interiorly of said cylinder assembly;

said cylinder assembly including a head disposed peripherally about said rod, and

the cap ring connected with said head for sealingly encompassing said piston rod;

the improvement comprising:

having said cap ring in two parts, the first part comprising a stuffing box and a second part comprising a wiper ring box; said stuffing box being connected with said head, including an annular space peripherally exteriorly of said rod; rod and adapted to hold seal means peripherally exteriorly of said rod; said wiper ring box being connected with said stuffing box, including an annular space peripherally exteriorly of said rod and adapted to hold at least a rod wiper peripherally exteriorly of said rod and contiguous said rod;

said seal means including a primary seal disposed peripherally exteriorly of said rod and within said stuffing box;

said rod wiper disposed peripherally exteriorly of said rod and within said wiper ring box;

said seal means, also, including a secondary seal disposed peripherally exteriorly of said rod, within said stuffing box, and intermediate said primary seal and said rod wiper;

bearing means disposed peripherally exteriorly of said rod, within said stuffing box, and intermediate said primary seal and said secondary seal for facilitating longitudinal movement of said rod and maintaining said rod centralized within said boxes; and

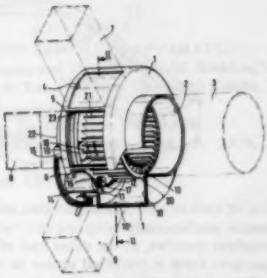
stop means disposed intermediate said primary seal and bearing means, and said secondary seal; said stop means dividing the annular space peripherally exteriorly of said rod in said stuffing box so as to define respective annular chamber spaces for said primary seal and said secondary seal with an annular space between said primary and secondary seals; and said stop means being adapted to stop longitudinal movement of said bearing means to prevent crushing said secondary seal and prevent rendering said secondary seal ineffective to form said annular space between said primary and secondary seals.

4,476,773

AIR DIFFUSER ASSEMBLY

Werner Fehr, Steinheim, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 28, 1982, Ser. No. 437,358
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1981, 3144899
Int. Cl.³ B60H 1/14
U.S. Cl. 98—2.08 14 Claims



1. A compact air diffuser assembly, comprising:

(a) a generally cylindrical housing comprising first and second generally planar end surfaces, an intermediate circumferential surface, three air discharge orifices positioned sequentially about a periphery of said housing, and an air intake orifice generally positioned on the first planar end surface coaxially with the cylindrical housing, wherein the discharge orifices are arranged along approximately one-half of the circumference of the housing;

(b) a blower comprising a radial blower wheel positioned within the housing and operable to force air through the housing; and

(c) a rotatably supported drum coaxially positioned within and movable relative to the housing, comprising three openings, wherein the openings are positioned about circumferential surface of the drum to selectively engage with the discharge orifices depending upon the angular position of the drum, wherein the dimensions of the openings correspond to the dimensions of the discharge orifices, and wherein two of the drum openings are located directly adjacent to each other along the circumferential surface, whereas the third drum opening is offset by approximately 180° with respect to one of the other two openings.

4,476,774

PORTABLE UNIVERSAL WIND DEFLECTOR

Samuel J. Liberto, 429 Parker St.; James Meli, 6981 Verona St., both of Verona, Pa. 15147, and Eugene J. Berardi, 6882 Alcoma Dr., Penn Hills, Pa. 15235

Filed Apr. 5, 1982, Ser. No. 365,506
Int. Cl.³ B60J 1/20
U.S. Cl. 98—2.13 7 Claims

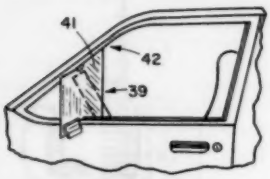
1. A portable wind deflector for use in a vehicle window opening with a window member in an open position and moveable from said open position to a closed position where said window member engages a window member receiving means, said wind deflector capable of providing air currents into a vehicle interior while being manually positionable to deflect air currents away from the window opening and drawing air from said vehicle interior, said wind deflector comprised of,

a wind deflecting body having first and second planar portions integrally joined along a line contained by both said first and said second planar portions to thereby form a

body with said first and second planar portions at an angle to each other,

said first planar portion extending beyond said line contained by both said first and said second planar sections, said extending planar portion having integral therewith means to direct air currents entering from a horizontal direction to a downward direction,

said first and said second planar portions having separate first and second window engaging means formed at one



end of each of said planar portions, said window engaging means mechanically coupling said wind deflector to said window member, at the other end of each of said planar portions there is provided means to mechanically couple either of said planar portions to said window member receiving means, whereby, depending upon which of said first or said second window engaging means is mechanically coupled to said window member, air currents from wind passing said vehicle will be drawn into said vehicle or deflected away.

4,476,775

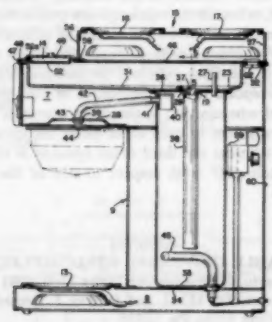
COFFEE MAKING MACHINE

Donald L. Daugherty, Sherman, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Continuation-in-part of Ser. No. 334,579, Dec. 28, 1981, Pat. No. 4,413,552. This application Jul. 1, 1983, Ser. No. 509,913

Int. Cl.³ A47J *31/00*

U.S. Cl. 99—295 **6 Claims**



1. In a cold water, pour-in beverage brewer, including: a generally C-shaped body providing upper and lower horizontal leg portions interconnected from the underside and topside, respectively, by an upright leg portion; means for supporting a removable brewer funnel underneath the upper leg portion; heater means on the lower leg portion for heating and supporting a beaker under said brewer funnel; an elongated shallow cold water basin housed within said upper leg portion; and a deep hot water tank depending from said basin and housed mainly within said upright leg portion; the improvements wherein said cold water basin and said hot water tank constitute an integral inverted L-shaped receptacle, the bottom of said cold water basin having an opening therein that mates with the top opening of said hot water tank, a plate closing off said mating openings, said plate having a drain opening therein, a cold water tube depending from the underside of said plate with the upper end thereof in alignment with said drain opening; said upper leg portion has a top opening and includes a removable cover therefor which also covers said basin, means on the top edge of said cold water basin for removably supporting said basin within said top opening, spacer means for supporting said removable cover above said cold water basin in spaced ralationship therewith, and an upstanding vent tube mounted on said plate having a relatively small bore which provides venting communication between the headspace of said deep hot water tank and said cold water basin, and said drain opening in said plate being substantially smaller than the interior of said cold water tube.

4,476,776

CENTRIFUGE CAGE FOR A COFFEE CENTRIFUGE

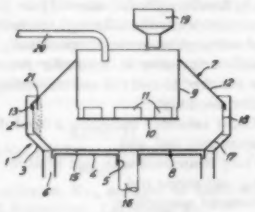
Albert Greutert, Sachseln, and Ruedy Gasser, Lucerne, both of Switzerland, assignors to Maxs AG, Sachseln, Switzerland

Filed Jun. 24, 1982, Ser. No. 391,820

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1981, 3126630

Int. Cl.³ A47J *31/22*

U.S. Cl. 99—302 C **17 Claims**



1. A centrifuge cage, more particularly for a coffee centrifuge, juice extractor or the like characterised by: a rotatable bottom member (**8, 48, 58**); a top member (**7, 37, 47**) which is releasably connected to said bottom member and is axially movable relative to said bottom member to bound a gap between itself and said bottom member; at least one mesh zone (**18, 40, 50, 68**) secured to at least one of said members in a radially outer zone of the periphery of said at least one member; and at least one distributor disc which corotates with the centrifuge cage and is disposed in the plane of the mesh zone.

4,476,777

COUNTERBALANCE DEVICE FOR ROTATABLE SHAFT

Leslie G. Dutchburn, 7 De Vere Gardens, Toronto, Ontario, Canada M5M 3E4

Filed Jun. 29, 1983, Ser. No. 508,736

Int. Cl.³ A47J *37/04*

U.S. Cl. 99—421 H **5 Claims**

1. A counterbalance device for a rotary shaft comprising,

a handle means detachably mounted to one end of said shaft, said handle means having a securing means operative to secure said handle means to said shaft and being adjustable to permit said handle means to be rotated with respect to said shaft,

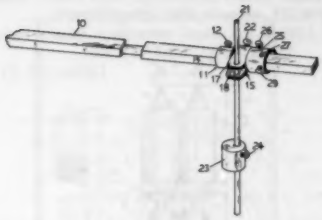
an extension member formed at a rear end of said handle means,

a bushing member operative to be mounted to said extension member, said bushing member having an adjusting means operative to secure said bushing member to said extension member,

at least two aligned openings in said bushing member,

a rod member operative to be inserted through said openings of said bushing member,

a fastening means in said bushing member operative to secure said rod member on said bushing member,



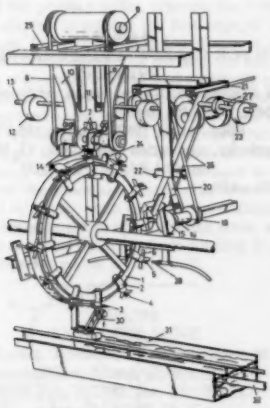
at least one weight means slidably mounted at selected postion on said rod member whereby to provide counterbalance for uneven weight distribution with respect to the longitudinal axis of said shaft.

4,476,778

ONION PEELING

Malcolm R. Clyma, Holden Hill, Australia, assignor to Spring Gully Pickles Pty, Limited, Australia

Filed Jul. 21, 1980, Ser. No. 170,634
Int. Cl.³ A23N *15/08*
U.S. Cl. 99—516 **3 Claims**



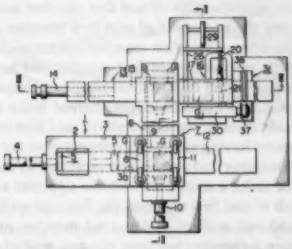
1. Apparatus for peeling onions, said apparatus comprising:
at least one wheel rotatably mounted on a shaft;
a plurality of radial sockets spaced circumferentially around said wheel, each socket fitted with a rotatable onion holder and each holder fitted with spike means to impale an onion on said holder; said holder adapted to move between at least two positions, a first position wherein an onion thereon has its longitudinal axis parallel with said shaft and a second position 90° thereto with said axis in the plane of said wheel;
a pair of spaced apart circular topping and tailing knives positioned one on each side of said wheel to simultaneously top and tail the onion as it passes therebetween when the onion holder is in said position;
finger means on said holders engageable with a fixed barrier to rotate said onion holder to said second position;
a pair of spaced apart circular rotary slitting knives positioned on each side of said wheel adapted to contact and slit the skin of said onion by slits extending along the longitudinal axis of said onion;
fluid means including at least one jet nozzle aligned with the path of travel of said onion and directed to the slit in the skin of said onion to loosen said slit skins from said onion;
stripper means through which said sockets pass for biasing said onion from said onion holding spikes means; and
a skin removal means for agitating said onion and releasing said slit skins.

4,476,779

COMPRESSION BUNDLING APPARATUS

Tsutomu Hasebe, Koganei, and Teigo Takahashi, Kodaira, both of Japan, assignors to Tezuka Kosan Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1979, Ser. No. 79,879
Claims priority, application Japan, Oct. 3, 1978, 53-135165[U]
Int. Cl.³ B65B *13/00*
U.S. Cl. 100—7 **1 Claim**



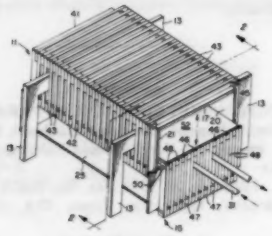
1. A compression bundling apparatus comprising:
a compression means, a bundling means and a conveyor means connecting said compression means and said bundling means;
said compression means comprising a compression device having a movable compression plate for compressing compressible material into a compressed block in a compression space therein;
said conveyor means having therein a reciprocating container for receiving said compressed block from said compression device and being within a guide space therein, which guide space directly intersects an outlet of said compression space and an inlet of said bundling means, said container adapted to be moved along said guide space from said compression space outlet to said inlet of said bundling means and to be returned when empty;
said bundling means comprising an extruding means and a band binding means at a bundling space in said bundling means wherein said extruding means comprises a cylinder and a push plate, said cylinder adapted to push said push plate against said compressed block in said container to extrude said block into said bundling space in said band bundling means, said bundling space having a wall portion and a movable door on the side opposite said push plate, said wall portion, movable door and push plate each have a plurality of matching slots for receiving binding band guides which range through the bundling space and serve as passages for said bands, after said compressed block is extruded into said bundling space; and a bundler adapted for moving in a vertical direction in relation to said compressed block to guide and move the binding bands through said bundling space by degrees to vertically bind said compressed block into a bundle.

4,476,780

CUBE PRESS

Jesse C. Bunch, Silver Spring, Md., assignor to Apollo Optics & Kinematics, Inc., Silver Spring, Md.

Filed Dec. 21, 1983, Ser. No. 563,811
Int. Cl.³ B30B *7/00, 15/04*
U.S. Cl. 100—214 **12 Claims**



1. A press comprising a first member having a first and second end walls on opposite sides of said first member, and side walls on opposite sides of said first member and connected to and joining the end walls of said first member and leaving two opposite sides of said first member open, a second member moveable with respect to said first member and having an end wall positioned within said first member and shaped and positioned so that two opposite edges thereof make a sliding fit with the inside faces of the side walls of said first member, said second member having side walls connected to the end wall of said second member and shaped and arranged so that the inside faces thereof make a sliding fit with the opposite edges of said first end wall of said first member, the first end wall of said first member, said end wall of said second member and said side walls defining a chamber between the end wall of said second member and the first end wall of said first member, and means to introduce fluid under pressure into said chamber to cause said chamber to expand by causing said second member to move toward the second end wall of said first member.

4,476,781

APPARATUS FOR STAMPING INDICIA ON MATERIALS

Edward F. Kubacki, Marengo; Edward C. Jacobs, Wauconda; John M. Masciale, and James R. Monroe, both of Palatine, all of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Sep. 30, 1982, Ser. No. 430,761
Int. Cl.³ B41F *17/00*
U.S. Cl. 101—3 R **24 Claims**

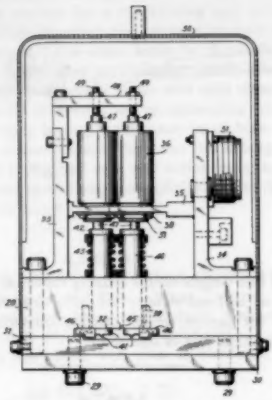
1. A marking system for stamping indicia marks into the surface of thin sheet material, comprising:

a platform having a surface for supporting and transporting said sheet material thereon, said sheet material being loosely guided;

a die with a raised marking at one longitudinal end thereof, said die being mounted for longitudinal motion in a direction transverse to said platform surface, said marking facing said platform surface;

an armature mounted for motion in said transverse direction, said armature being in contact with the other longitudinal end of said die;

means for moving said armature toward said surface from a standby position, said armature driving said die against said sheet material, said die flying ballistically toward said material to inelastically deform said material and being stopped only by said sheet material being pressed against said platform surface upon impact by said die, said means for moving including means for imparting a predetermined longitudinal kinetic energy to said die of a magnitude sufficient, without substantial excess, to provide said inelastic deformation.

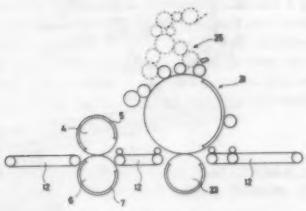


4,476,782

METHOD FOR GLAZING PRINTING AREA IN THICK PRINTING

Katsutoshi Matsumoto, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jun. 7, 1982, Ser. No. 385,773
Claims priority, application Japan, Jun. 12, 1981, 56-91068
Int. Cl.³ B41M *1/06, 7/00*
U.S. Cl. 101—450.1 **3 Claims**



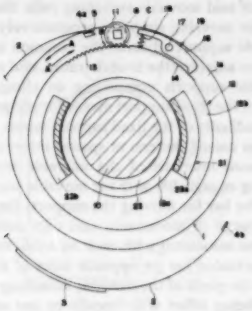
1. A method for glazing an image formed with a thick deposit of viscous oil-based ink on a non-absorbent object wherein the ink image is initially formed with an uneven surface comprising forming an image with viscous oil-based ink on the surface of a plate carried by a first cylinder having a lipophilic image region and a lipophobic non-image region, transferring the ink image from the first cylinder surface directly to a non-absorbent surface of an object to be printed to produce a viscous ink image formed by the thick deposit of ink having an uneven surface, pressing the uneven ink surface of the ink image in the absence of applied heat before the ink has completely dried with a second cylinder having a smooth resilient lipophobic surface made of silicone rubber while moving the surface of the second cylinder in synchronism with the surface of the object to smooth the uneven surface, and then drying the ink.

4,476,783

DEVICE OF SECURING A FILM BEARING INDICIA ON THE PRINTING ROLL UNDER TENSION

Yasuhiro Tsukasaki, Osakashi, Japan, assignor to Kabushiki Kaisha Shinko Kikai Seisakusho, Osaka, Japan

Filed Aug. 30, 1983, Ser. No. 527,901
Claims priority, application Japan, Sep. 1, 1982, 57-132720[U]
Int. Cl.³ B41F 27/06, 27/12
U.S. Cl. 101—415.1 1 Claim



1. A device of securing a film bearing indicia on the printing roll under tension, the device comprising:

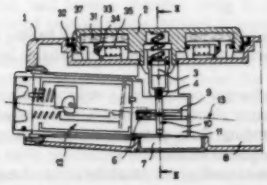
a first engager and a second engager provided at each end of the film, a first receiving means and a second receiving means provided adjacent to each other on the peripheral surface of the printing roller, wherein the first receiving means is adapted to receive the first engager of the film and wherein the second receiving means is adapted to receive the second engager of the film, the second receiving means comprising a slotted rod rotatively placed in an accommodation groove produced in the printing roll, and a pinion secured to the terminating end of the rod, a rotor rotatively provided at one end face of the printing roll, the rotor having a first tooth zone and a second tooth zone in its periphery, wherein the first tooth zone is adapted to engage with the pinion and wherein the second tooth zone is adapted to engage with a ratchet mechanism provided in place alongside the periphery of the rotor, and a brake means for stopping the rotor from rotating in association with the rotation of the printing roll.

4,476,784

ANTI-TANK MINE

Jean-Pierre Reynes, Toulouse, France, assignor to Societe E. LaCroix-Tous Artifices, Muret, France

Filed Jun. 7, 1982, Ser. No. 385,717
Int. Cl.³ F24B 23/28
U.S. Cl. 102—428 10 Claims



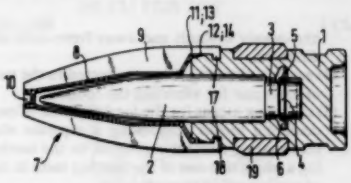
1. An anti-tank mine having a casing, a pressure plate, a pyrotechnic firing and fire transmission chain constituted by a striker, a primer, a firing relay and a firing unit, a useful explosive charge, and an arming device, and comprising an improvement wherein the firing relay is mounted on a disc mobile in rotation about a shaft, said shaft being borne by a member itself mobile in rotation about an axis substantially perpendicular to the shaft of the mobile disc, and said relay being adapted to ensure alignment of the pyrotechnic chain by rotation of the disc about the shaft and rotation of the member about the axis, the rotation of the member ensuring alignment of the plane of the disc with the upstream part and the downstream part of the pyrotechnic chain, and the rotation of the disc ensuring alignment of the firing relay with these same elements of the chain.

4,476,785

SABOT PROJECTILE

Dietrich Hoffman, Schramberg, and Udo Götz, Trossingen, both of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,376
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1981, 3131540
Int. Cl.³ F42B 13/16
U.S. Cl. 102—522 2 Claims



1. A sabot projectile comprising:

a sabot having a front end face, a smooth tapered annular zone extending rearwardly from said front end face and a circular groove to the rear of said annular zone;

a projectile core retained in said sabot and having a front end; and

a hood secured to said sabot over said front end of said projectile core, said hood comprising a shell completely enclosing said front end of said projectile core and having a rearwardly and outwardly extending resilient sealing rim extending around said core and engaged against said annular zone, said hood including a plurality of axially extending webs extending outwardly of said shell and defining axially extending grooves therebetween, each of said webs and each of said grooves extending axially rearwardly of said resilient sealing rim and each of said webs including a rearwardly inwardly extending nose clampingly engaged in said circular groove of said sabot for pressing said resilient sealing rim against said annular zone.

4,476,786

BALLAST TAMPING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Feb. 10, 1982, Ser. No. 347,434
Claims priority, application Austria, Mar. 9, 1981, 1085/81
Int. Cl.³ E01B 27/16
U.S. Cl. 104—12 8 Claims

1. A machine for tamping ballast under a tie to which rails of a track are fastened, comprising

(a) a frame, and

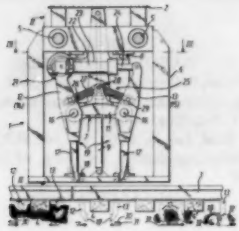
(b) a tamping tool unit vertically adjustably mounted on the frame in vertical alignment with a respective one of the track rails, the unit including

(1) a tamping tool carrier,

(2) respective pairs of tamping tools mounted on the car-

rier for pivotal movement in the direction of the track independent of each other, the pairs of tamping tools being respectively arranged on the field side and the gage side of the respective track rail for immersion in the ballast adjacent a point of intersection of the tie and rail where the track is supported on the ballast,

(3) a single hydraulic reciprocating drive connecting the tamping tools of each pair for pivoting the tamping tools of the pair independently of each other and asynchronously towards and away from each other in said direction,



(4) a single vibrating drive connected to the tamping tools of each pair for vibrating the tools, and

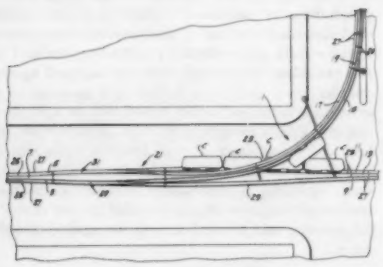
(5) centering means for the tamping tools of each pair, the centering means comprising a separate elastic force-transmitting element supported on the carrier and biasing a respective one of the tamping tools in the direction of reciprocation thereof.

4,476,787

RAILWAY SWITCH

Lawrence K. Edwards, 3507 Slade Run Dr., Falls Church, Va. 22042

Filed Apr. 23, 1982, Ser. No. 371,283
Int. Cl.³ B61J *1/06*
U.S. Cl. 104—96 **8 Claims**



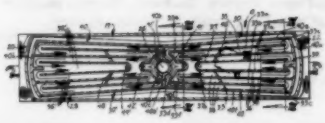
1. A switch for a railway system having a common track, a first branch track constituting an upper branch track, and a second branch track constituting a lower branch track, each track comprising a pair of rails with one rail of the pair disposed above the other, said switch comprising fixed support means between said common and branch tracks, a first pair of fixed switching rails, constituting an upper pair of fixed switching rails, on said fixed support means associated with the upper branch track, a second pair of fixed switching rails, constituting a lower pair of fixed switching rails, on said fixed support means associated with the lower branch track, a pair of movable switching rails movable between a raised position in which the pair extends between the common track and the upper pair of fixed switching rails and a lowered position in which the pair extends between the common track and the lower pair of fixed switching rails, a plurality of movable supports carrying the movable switching rails mounted on the fixed support means at spaced intervals therealong, each movable support being guided for movement transversely with respect to the direction of length of the movable switching rails and generally in the plane of these rails, and means engageable with said movable supports for moving each support through a predetermined range of movement with respect to the fixed support means transversely with respect to the direction of length of the movable switching rails and generally in the plane of said movable switching rails, the range of movement of the movable supports progressively increasing from the movable support adjacent the common track to the movable support adjacent the branch tracks, said means for moving the movable supports comprising an elongate actuator bar mounted on the fixed support means for reciprocation along its axis longitudinally of the fixed support means, said actuator bar having cam means thereon at spaced intervals corresponding to the spaced intervals of the movable supports, said cam means being engageable with the movable supports on reciprocation of the bar for moving the supports through said predetermined range of movement, said cam means comprising a pair of cams associated with each movable support projecting from the actuator bar on opposite sides of the bar in a plane parallel to the plane of the movable switching rails, the cams of each pair being offset with respect to one another longitudinally of the bar, one cam of the pair having a camming surface engageable with a respective movable support on movement of the bar in one direction for moving the support to one extreme of its range of movement, and the other cam of the pair having a camming surface engageable with the support on movement of the bar in the opposite direction for moving the support to the opposite extreme of its range of movement.

4,476,788

HEATED RAILROAD TANK CAR

Richard Loevinger, P.O. Box 68, Brandon, S. Dak. 57005

Continuation-in-part of Ser. No. 385,869, Jun. 7, 1982,. This application Dec. 30, 1982, Ser. No. 454,537
Int. Cl.³ B61D *5/00, 27/00*; F24H *9/16*
U.S. Cl. 105—451 **53 Claims**



1. For use in a fluid lading carrying tank having a discharge duct, a heat exchanger for heating a congeliable lading in said tank,

said heat exchanger comprising a structure adapted to abut said discharge duct and having a plurality of longitudinally extending flow passages adapted to receive and conduct a heated medium,

said structure extending substantially across the entire lower portion of said tank and being configured and inclined along longitudinal and transverse axes and defining a low area to develop gravity drainage,

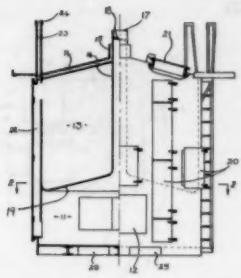
said heat exchanger having an inlet and an outlet substantially encompassing in heat exchange relationship and disposed adjacent said discharge duct within the tank.

4,476,789

METHOD OF AND APPARATUS FOR THE PRODUCTION OF CHARCOAL

Anthony Constantine, 59, Zamia Rd., Gooseberry Hill, Western Australia, Australia 6076

Filed Aug. 31, 1982, Ser. No. 413,516
Claims priority, application Australia, May 31, 1982, PF4227
Int. Cl.³ C10B 21/20, 27/04
U.S. Cl. 1.10—229 2 Claims



1. A charcoal producing apparatus comprising a combustion chamber, a heating chamber located above the combustion chamber and arranged to receive carbonaceous material, first passage means interconnecting the combustion chamber and discharge flue means, said first passage means comprising an annulus surrounding said heating chamber and at least one axial passage through said heating chamber, second passage means interconnecting the heating chamber and the combustion chamber, said heating chamber being in communication with said second passage means through an opening located in an upper portion of the heating chamber, and said second passage means also being open to atmosphere and having means for shutting it off from the atmosphere, said provisions of the opening located in the upper portion of the heating chamber producing self sealing means in that heavier than air volatiles given off at the end of heating are retained in the space above the body of carbonaceous material to prevent combustion thereof during cooling, wherein said second passage means has no wall in contact with the ambient air, and wherein a perforated plate is located at the top of the combustion chamber and below the heating chamber to spread heat from combustion in the combustion chamber and to reduce oxidation of a wall of the heating chamber adjacent the combustion chamber.

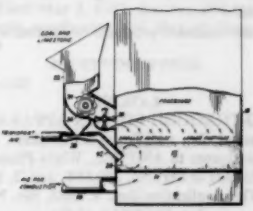
2. Charcoal producing apparatus comprising a combustion chamber, a discharge flue means, a heating chamber located above the combustion chamber and arranged to receive carbonaceous material, first passage means extending at least through the heating chamber and interconnecting the combustion chamber and said discharge flue means, second passage means interconnecting the heating chamber and the combustion chamber, said heating chamber being in communication with said second passage means through an opening located in an upper portion of the heating chamber, and said second passage means also being open to atmosphere, means for shutting off said second passage means from the atmosphere, a body of carbonaceous material in the heating chamber, whereby when the combustible material is placed in the combustion chamber, the combustible material in the combustion chamber is burnt producing hot gases which pass through the first passage means the body of carbonaceous material is heated sufficiently to cause the carbonaceous material to give off volatile material, the second passage means being open to atmosphere initially whereby the volatile material given off is vented to atmosphere until the moisture has been substantially eliminated, whereupon the second passage means is shut off from the atmosphere so that the now combustible volatile material given off is directed through the second passage means from the heating chamber into the combustion chamber for combustion therein, heating being continued until destructive distillation of the body of carbonaceous material is substantially complete at which time heavier than air volatiles given off from the body of carbonaceous material are retained in the heating chamber above the body of carbonaceous material and to thereby prevent combustion of the body of carbonaceous material during cooling, further wherein first passage means of the apparatus comprises an annulus surrounding said heating chamber and at least one axial passage through said heating chamber.

4,476,790

METHOD OF FEEDING PARTICULATE MATERIAL TO A FLUIDIZED BED

Richard W. Borio, Somers, and Stephen L. Goodstine, Windsor, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 279,486, Mar. 20, 1981, abandoned, which is a continuation-in-part of Ser. No. 32,437, Apr. 23, 1979, abandoned. This application Jun. 1, 1982, Ser. No. 383,857
Int. Cl.³ F22B 1/00
U.S. Cl. 110—245 1 Claim



1. A method of feeding additional particulate material into a fluidized bed of said particulate material established in a chamber above and supported upon a distribution plate having a plurality of holes formed therein, the bed fluidized by passing air upwardly through the distribution plate into said particular material, comprising the steps of:

a. providing the distribution plate with fewer or smaller holes adjacent to the perimeter of the distribution plate,
b. selectively distributing the fluidizing air passing upwardly through the distribution plate so as to pass a lesser amount of the fluidizing air upwardly into the bed through said fewer or smaller holes thereby establishing a turbulent downflow region within the bed at the periphery thereof;
c. separating the relatively fine particulate material from the relatively coarse particulate material in said feed material;
d. projecting the separated relatively coarse particulate material outwardly into the chamber through an opening in the wall of the chamber located above the surface of the fluidized bed;
e. entraining the relatively fine particulate material in a stream of air; and
f. injecting the air stream with the relatively fine particulate material entrained therein directly into the turbulent downflow region established within the bed.

4,476,791

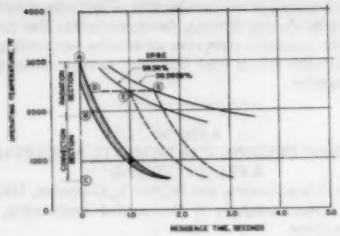
HAZARDOUS WASTE STEAM GENERATOR

John M. Cegielski, Jr., Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed May 25, 1983, Ser. No. 498,006
Int. Cl.³ F23G 7/00
U.S. Cl. 110—346 5 Claims

1. A method of converting fluids which are or contain principle organic hazardous constituents (POHC) into non hazardous constituents comprising the sequential steps of:

burning the POHC, first cooling products of combustion from said burning by heating a fluid in a heat exchange tubing by radiant heat from said burning to a given temperature for converting said POHC to non-hazardous constituents;



maintaining said given temperature for sufficient residence time such that substantially all of said POHC is converted; thence

second cooling said products of combustion and converted POHC by convection heating a fluid in heat exchange tubing; and

exhausting the resultant products of combustion.

4,476,792

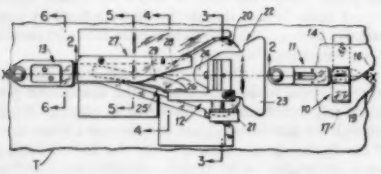
FEED-THROUGH FOLDER APPARATUS

George P. Diacont, Jr., and James D. Grisham, both of Richmond, Va., assignors to AMF Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 250,814, Apr. 3, 1981, Pat. No. 4,395,963. This application Jun. 9, 1983, Ser. No. 502,842

Int. Cl.³ D05B *35/02*

U.S. Cl. 112—142 **8 Claims**



1. A folder for making Z-type folds in material, comprising

a material supporting surface having an opening extending longitudinally in the direction of travel of the material to be folded;

a blade spaced above said surface extending downwardly into said opening forming a tongue depressing the material causing a slack in the material to be folded;

a pair of folder blades extending along opposite sides of said opening from adjacent said tongue at one end to the down-stream end of said opening at the other end with one of said blades positioned to contact the top surface of the material and the other of said blades positioned to contact the bottom surface of the material;

said folder blades having laterally spaced control edges adjacent said tongue which cross over one another and are laterally spaced in a reverse direction at the dow-stream end of said opening;

said folder blades cooperating to urge the slack portion of the material around said control edges and between said folder blades thereby forming a Z-type fold as the material moves through said folder.

4,476,793

EMBROIDERY MACHINE

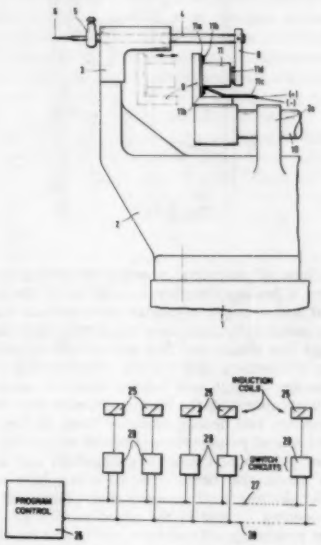
Hans Conrads, Tönisvorst; Josef Hoffmans, Geldern; Hans Hippel; Hubert Hoven, both of Krefeld; Hans Rolaussf, and Max Schäfer, both of Krefeld, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Karl Zangs AG, Krefeld, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 325,620

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3047928

Int. Cl.³ D05B *55/16*

U.S. Cl. 112—221 **20 Claims**



1. In an embroidery machine having a plurality of individual embroidery bars, particularly needle and piercer bars on shuttle embroidery machines, which are mounted for axial displacement independently of each other and are aranged alongside of each other in at least one row, said individual embroidery bars each being adapted to be coupled to a reciprocating drive element in accordance with a program determined by a program control by a magnet means, the improvement comprising:

at least one said magnet means respectively for operatively coupling each said individual embroidery bars to said reciprocating drive element,

all said magnet means together including:

one common energy line,

one control line connected to said program control,

a plurality of induction coils of all said magnet means, respectively, connected to a source of energy via said common energy line,

a plurality of frequency-dependent switching circuit means jointly connected to said control line,

each of said switching circuit means having its own frequency of response which differs from others of said switching circuit means and being operatively connected with each of said induction coils, respectively,

said program control constituting means for sending out the program as a frequency spectrum,

said switching circuit means for controlling energization of corresponding of said induction coils via said control line in accordance with the frequency spectrum sent out by said program control.

4,476,794

NEEDLE CLAMP ARRANGEMENT FOR A SEWING MACHINE

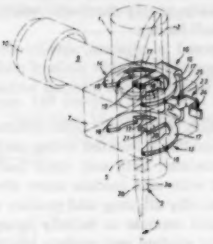
Helmar Holl, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to Dorina Nahmaschinen GmbH, Fed. Rep. of Germany

Filed May 13, 1983, Ser. No. 494,398

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1982, 8224945[U]

Int. Cl.³ D05B 55/02

U.S. Cl. 112—226 6 Claims



1. A device for holding a sewing needle which has a shank with an arcuate portion and a flat wall portion received in a cylindrical needle bar which has a longitudinally extending receiving groove in a flat interior receiving wall at the inside of the groove, comprising a locking member having a longitudinally extending bridge part, arm means carried by said bridge part and extending around at least a portion of the circumference of said needle bar, an upper arm carried by said bridge part and extending outwardly from said bridge part into the groove and defining a stop for the top of the needle shank, and a lower abutment arm extending outwardly from said bridge portion having an outer edge of arcuate shape which engages around the arcuate portion of said needle shank and acts to position the flat wall of the shank against the flat wall of said groove.

4,476,795

REVERSIBLE FEED MECHANISM FOR SEWING MACHINES

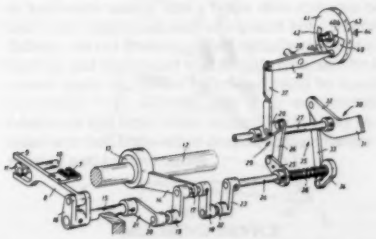
Kurt Vollmar, Weilerbach, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 473,143

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209896

Int. Cl.³ D05B 27/22

U.S. Cl. 112—316 10 Claims



1. A setting mechanism for the feed dog of a sewing machine having drive means for driving the dog to execute a feed motion, a setting shaft engaged with the drive means and rotatable to set an amount and direction of the feed motion, a setting element engaged through a first linkage with the setting shaft for moving the setting shaft to adjust the feed motion amount, a reversal lever connected to the first linkage and movable between at least two positions to move the setting shaft for reversing the direction of the feed motion, and biasing means engaged with the first linkage for biasing the reversal lever into one of its two positions, and further comprising, a second linkage connected between the reversal lever and the biasing means for varying an amount of force applied by the biasing means on the reversal lever with movement of the reversal lever.

4,476,796

UPPER CLOTH FEED IN A SEWING MACHINE

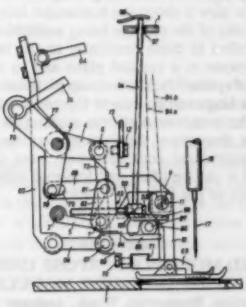
Kurt Vollmar, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,514

Claims priority, application Fed. Rep. of Germany, May 18, 1981, 3119716

Int. Cl.³ D05B 27/04

U.S. Cl. 112—320 13 Claims



1. An upper cloth feed device for a sewing machine having a casing comprising:

an upper feed foot having a vertically and horizontally moving carrier;

first drive means connected to said feed foot carrier for moving said feed foot carrier in the cloth feed direction by a selected distance;

a presser foot having a vertically movable carrier;

second drive means connected to said feed and presser foot carriers for raising and lowering said carriers, said second drive means having a connecting member connecting said feed and presser foot carriers with a surface extending between and across at least one of a first linkage connecting said second drive means with said presser foot carrier and a second linkage connecting said second drive means to said feed foot carrier;

a spring for biasing said connecting member downwardly to bias said feed and presser foot downwardly by selected forces; and

position adjustment means for interengaging said spring with said surface at selected locations on said surface for adjustably distributing the biasing force of said spring to said feed foot and presser foot respectively.

4,476,797

APPARATUS FOR ASSEMBLING A SHIP HULL MODULE

Jury P. Ivanov, Grazh-dansky prospekt, 92/2, kv. 1; Anatoly B. Averbukh, ulitsa Nalichnaya, 3/21, kv. 67; Evgeny A. Evstafiev, ulitsa Karpinskogo, 31/1, kv. 139, and Alexandr E. Tarasov, Tallinskaya ulitsa, 6-a, kv. 23, all of Leningrad, U.S.S.R.

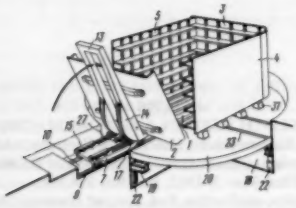
PCT No. PCT/SU81/00050, § 371 Date Jan. 22, 1982, § 102(e) Date Jan. 22, 1982, PCT Pub. No. WO81/03474, PCT Pub. Date Dec. 10, 1981

PCT Filed May 29, 1981, Ser. No. 346,055

Claims priority, application U.S.S.R., Jun. 4, 1980, 2926009; Jun. 4, 1980, 2926011

Int. Cl.³ B63B *3/00, 9/00*

U.S. Cl. 114—65 R 2 Claims



1. An apparatus for assembling a ship hull module, comprising a bearing platform mounting a turnover platform fitted with a drive to turn it about the horizontal axis and grippers to hold the sections of the module being assembled; an additional platform installed in close proximity to the bearing platform and to reciprocate in a vertical plane and to rotate about the vertical axis of symmetry; the bearing platform being provided with movable bogies to roll on to the additional platform, the grippers of the turnover platform moving in three mutually perpendicular directions, the gripped section being movable along the longitudinal and transverse axes of the turnover platform, and it can be lifted and lowered with respect to the bearing surface of the turnover platform.

4,476,798

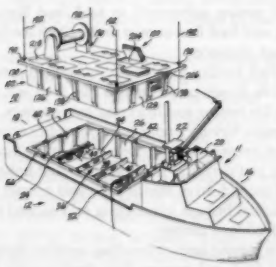
INTEGRATED MULTIPLE PURPOSE UNIVERSAL SHIP HULL AND REPLACEMENT MODULE SYSTEM

George S. Backus, Bremerton, Wash., assignor to Consolidated Olympic Corporation, Silverdale, Wash.

Filed Aug. 17, 1982, Ser. No. 408,910

Int. Cl.³ B63B *3/08*

U.S. Cl. 114—77 R 24 Claims



1. An integral vessel hull and module system for interchangeably mounting on a universal vessel hull different function specific modules for converting the vessel for use for selected operational functions, the universal vessel hull having a propulsion engine, navigation and module support means, said system comprising:

(a) a universal hull having an inner hull structure composed of interior, upright walls extending downwardly from the deck of the hull to intersect a floor structure near the bottom of the hull to form an upwardly open well which occupies a major portion of the width of the vessel and a major portion of the length of the vessel;

(b) a replaceable, function specific module having an interior portion configured for a specific operational function of the vessel and a universal, unitary outer shell which is downwardly, slidably, snugly receivable within said hull well, said outer shell having:

upright walls disposed in adjacent, side-by-side relationship with corresponding upright walls of said inner hull structure when said module is inserted within said hull well, and

a base portion which rests on the floor structure of said hull when said module is inserted within said hull well;

(c) guide means associated with said inner hull structure upright walls and with said module outer shell upright walls, for automatically aligning said module relative to said hull when said module is initially being inserted within said hull for guiding said module relative to said hull along substantially the entire relative movement of said module and hull during insertion and removal of said module into and from said hull and for restraining relative horizontal movement between said module and said hull, said guide means being integrated into the construction of the upright walls of the inner hull structure and the outer shell at spaced apart locations along the length of said upright walls; and,

(d) restraining means for restraining relative vertical movement between said module and said hull.

4,476,799

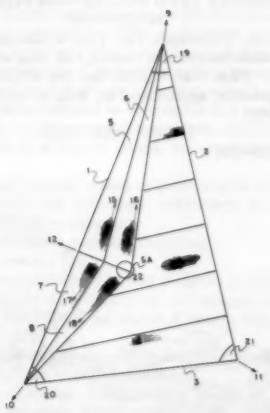
SAILS

Stephen D. Bandy, 515 Epping Forest Rd., Annapolis, Md. 21401

Filed Sep. 29, 1982, Ser. No. 428,304

Int. Cl.³ B63H *9/06*

U.S. Cl. 114—103 3 Claims



1. An improved jib sail for a sailing yacht having a luff region extending between the head and tack of said jib sail, said luff region comprising upper and lower groups of triangular panels of woven cloth, each of said panels having an apex, a base, and a trailing edge, each of said panels further having warp threads extending substantially parallel to said trailing edge, said apex of each of said panels of said upper group

convergent at the head of said jib sail and said apex of each of said panels of said lower group convergent at the tack of said jib sail, said base of each of said panels being joined along a common seamline, said seamline being substantially perpendicular to the luff of said jib sail and passing nearly through the locale of resultant wind force on said jib sail; wherein said warp threads provide maximum sail strength along a line extending from the head of said jib sail into a region near the locale of resultant wind force on said jib sail and thence to the tack of said jib sail thus producing a truss-like structure of panels transferring the wind load to the head and tack, thereby reducing the need for headstay support.

4,476,800

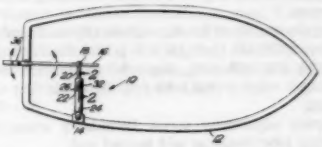
TILLER CONTROL DEVICE

John W. Gage, 110 Jumping Brook Rd., Lincroft, N.J. 07738

Filed May 14, 1982, Ser. No. 378,198

Int. Cl.³ B63H *25/52*

U.S. Cl. 114—172 **5 Claims**



1. A tiller control device for controlling the position of a tiller on a watercraft, comprising:

a shaft adapted to be attached to one of said tiller and said watercraft;

a variable pressure brake adapted to operatively engage said shaft for exerting pressure thereon, said brake adapted to be attached to the other of said tiller and said watercraft; said variable pressure brake comprising:

an outer casing;

and control means for selectively positioning said tiller are attached to said brake for variably adjusting the amount of said pressure exerted on said shaft; an axially disposed cavity within said outer casing; and

a brake sleeve axially disposed within a predetermined portion of said cavity in abuttment with at least a portion of the inner surface of said outer casing, said shaft being disposed within said brake sleeve, said control means being in communication with said brake sleeve and acting to impart a radially inward force on said brake sleeve such that said brake sleeve is forced to bear upon said shaft with a pressure determined by said control means; said control means comprising an adjustment bolt threadedly secured to said outer casing, and a brake shoe disposed between said brake sleeve and said adjustment bolt, whereby said radially inward force is applied radially to the axis of said shaft by said adjustment bolt directly from said brake shoe to said brake sleeve and may be adjusted by turning said adjustment bolt, whereby said shaft may remain fixed relative to said brake when unattended but may be moved relative to said brake when desired without further adjustment of said control means.

4,476,801

MOORING DEVICE

Derek Foster, and Colin Rich, both of Brampton, Canada, assignors to John T. Hepburn Limited, Mississauga, Canada

Filed Sep. 13, 1982, Ser. No. 417,264

Int. Cl.³ B63B *21/50*

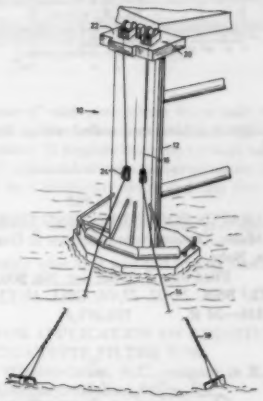
U.S. Cl. 114—230 **8 Claims**

1. A mooring device for handling anchor line of the type comprising an upper length of wire rope in series with a lower length of chain cable, the mooring device comprising:

a support frame;

winch means secured to the support frame for hauling and paying out the wire rope;

windlass means secured to the support frame for hauling and paying out the chain cable including a chain wheel having a hub, a pair of flanges fixed to the hub and whelps for grasping links of the chain cable between the flanges, the chain wheel being so positioned relative to the winch means when the mooring device is located in its operative position that the anchor line can be hauled substantially vertically between the flanges of the chain wheel by the winch means; and,



anchor line retraction means secured to the support frame for releasably drawing a portion of the anchor line having a lower portion composed of links of the chain cable from a substantially vertical position in which the anchor line portion extends from the winch means downwardly between the flanges of the chain wheel to a retracted position in which the lower portion engages the whelps of the chain wheel whereafter the windlass means can be activated to rotate the chain wheel thereby hauling the chain cable upwardly.

4,476,802

ANCHOR

Leendert Poldervaart, La Turbie, France, and John Cuckson, Monaco, Monaco, assignors to Single Buoy Moorings, Inc., Marly, Switzerland

Filed May 18, 1983, Ser. No. 495,609

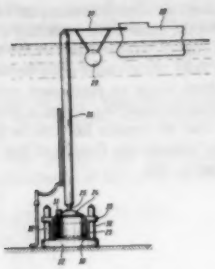
Claims priority, application Netherlands, May 17, 1982, 8202026

Int. Cl.³ B63B *21/27*

U.S. Cl. 114—296 **4 Claims**

1. In an anchor for connecting or attaching a buoyant device, said anchor comprising a first body which is anchored on the ocean floor, and a second body which is connected to the buoyant device, said first and second bodies cooperating with each other such that between said bodies a sealed space is formed within which a pressure can be created which is lower than the water pressure outside said bodies; the improvement in which said first body has a vertical guide element for the second body, the guide element being a cylinder open at the

top and closed at the bottom and the second body being a cylinder which by means of a circumferentially extending



sealing ridge is guided and sealed within the first-mentioned cylinder.

4,476,803

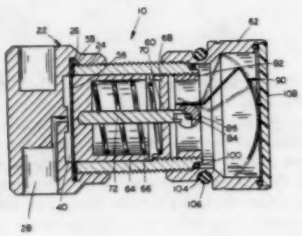
APPARATUS FOR INDICATING TIRE PRESSURE

Jerry P. Malec, Omaha, Nebr., assignor to Dual Dynamics, Inc., Lincoln, Nebr.

Filed Jun. 3, 1983, Ser. No. 500,990

Int. Cl.³ B60C *23/02, 23/06;* G01L *19/12;* F16K *15/20*

U.S. Cl. 116—34 R **2 Claims**



1. A tire monitor for use with a pair of pneumatic tires, comprising,

an externally threaded, hollow spring tube means having first and second ends,

a valve body threadably mounted on said first end of said spring tube means, having a hollow inner end which threadably receives said one end of said spring tube means, a diaphragm valve means mounted in said valve body at said one end of said spring tube means to define a first chamber in said valve body, said valve body having a first air passageway formed therein which communicates with said first chamber, a second air passageway formed therein which communicates with the interior of one of said tires and said first air passageway, a third air passageway formed therein which communicates with the interior of the other of said tires and said first chamber, and a fourth air passageway formed therein which communicates with said first chamber,

valve means connected to said fourth air passageway to permit air under pressure to be selectively supplied to said fourth air passageway and said first chamber at times,

said diaphragm valve means being movable between first and second positions, said diaphragm valve means sealing said first air passageway, when in its said first position, to prevent air communication between said second air passageway and said third air passageway,

a spring guide slidably mounted in said spring tube means and having a first end adjacent one side of said diaphragm valve means, said spring guide having an open second end,

a spring means received in said open second end of said spring guide,

a spring adjustment screw threadably mounted in said spring tube means adjacent said second end for adjustably varying the compression of said spring means,

an elongated display rod having one end secured to said spring guide and its other end slidably extending through said spring adjustment screw,

a scale pan means operatively pivotally secured to said spring tube means at said second end thereof and extending therefrom,

said display rod having its other end in operative engagement thereof with said scale pan means for causing the pivotal movement thereof,

said scale pan means having a visual display portion comprising a plurality of generally rectangular display segments positioned in a side-by-side relationship,

and a scale pan cover threadably mounted on said second end of said spring tube means enclosing said scale pan means,

said scale pan cover having a generally rectangular window formed therein through which said display segments are visible for indicating the relative position of said diaphragm valve means with respect to said first air passageway,

a display adjustment screw threadably mounted in said spring tube means at said second end,

a rotatable barrel means mounted on said display adjustment screw and having its rotational axis disposed transversely with respect to said display rod,

said scale pan means secured to said barrel means,

said display rod engaging said barrel means to cause said barrel means and scale pan means to rotate in one direction, said barrel means being spring biased to yieldably urge said barrel means to rotate in a direction opposite to said one direction,

rotation of said display adjustment screw causing said barrel means to be longitudinally movably adjusted.

4,476,804

PROCESS OF COATING OF PARTICLES, PARTICULARLY PARTICLES OF MEDICINAL DRUGS, AND APPARATUS FOR IMPLEMENTATION OF THE PROCESS

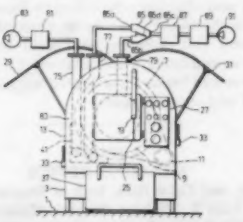
Werner Glatt, Binzen, and Erwin Grab, Rummingen, both of Fed. Rep. of Germany, assignors to Glatt Maschinen-und Apparatebau AG, Pratteln, Switzerland

Filed Jan. 28, 1983, Ser. No. 462,089

Claims priority, application Switzerland, Jan. 29, 1982, 555/82

Int. Cl.³ A23G *3/26*

U.S. Cl. 118—19 **17 Claims**



1. An apparatus for coating particles comprising:

a drum mounted for rotation about an axis, said drum having a circumferentially extending wall section containing perforations;

a housing encompassing said drum;

means for rotating said drum so that particles within the portion of the drum containing perforations form a layer in the lower portion of the drum;

means disposed within the drum for spraying coating material on the particles;

first chamber means having a portion positioned adjacent the periphery of the drum and including an opening for introducing gas through perforations which are substantially covered by said layer of particles and into the interior of the drum to thereby dry sprayed particles; and

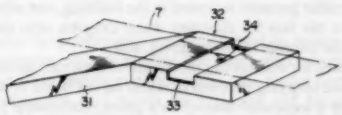
second chamber means spaced from said first chamber means and having a portion adjacent the periphery of the drum, said second chamber means including an opening for removing gas from the drum through perforations which are substantially covered by said layer of particles.

4,476,805

APPARATUS FOR COATING ONE SIDE ONLY OF STEEL STRIP WITH MOLTEN COATING METAL

Seizun Higuchi, Kitakyushu; Kazuhiro Tano, Nakama; Minoru Kamada, and Susumu Okamoto, both of Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 108,154, Dec. 28, 1979, Pat. No. 4,296,145.
This application May 5, 1981, Ser. No. 260,829
Claims priority, application Japan, Dec. 30, 1978, 53-165280
Int. Cl.³ B05C *3/18;* C23C *1/02*
U.S. Cl. 118—65 **16 Claims**



1. In an apparatus for continuously coating one side only of a steel strip with a molten coating metal comprising a coating metal melting pot, a chamber holding a non-oxidizing atmosphere and having a bottom immersed in the molten coating metal in said pot, an inlet through which a bare strip is supplied and an outlet through which the strip, coated on one side only, is discharged, a pair of guide rolls horizontally supported on the entry and exit sides above the coating metal melting poit in the chamber, the guide rolls bringing substantially horizontally bringing the strip close to the coating metal bath, a coating metal transfer guide having an inlet opening below the surface of the metal bath and an outlet opening above the bath surface between said paired guide rolls, and an electromagnetic pump disposed close to the guide at the entry end therof, extending in the flow direction of the coating metal, the electromagnetic pump sends the coating metal from the inlet to the outlet of the guide, producing a shifting magnetic field in the direction of the metal flow, to form a rising stream of the coating metal on the exit side of the guide outlet so as to come in contact with the bottom side of the strip, the improvement comprising:

said guide has an overflow box, which has an overflow port opening upward, on the exit side thereof; and

said overflow port offers less resistance to the coating metal stream widthwise than lengthwise.

4,476,806

WET FILM APPLICATOR

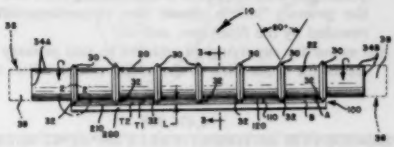
Stephen E. Lubniewski, Endicott, and Christian Haggenmiller, Owego, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 31, 1982, Ser. No. 413,297
Int. Cl.³ B05C *17/02*
U.S. Cl. 118—110 **1 Claim**

1. An applicator used in applying a film of a uniform thickness of wet material on a flat surface being in a level position of a workpiece, said applicator comprising:

a metal cylindrical rod, the length of said rod being substantially greater than the diameter of said rod,

a plurality of annularly-shaped protrusions extending from an external surface of said rod, said protrusions being positioned on said rod such that said uniform thickness of said wet material is applied, said protrusion extending from said rod a predetermined distance equal to about said uniform thickness, said protrusions being spaced apart by a substantial distance in comparision to said predetermined distance of said protrusions from said rod, and having a cross section of a truncated isosceles triangle having sides about 30 degrees from the vertical, said external surface of said rod between said protrusions applying said material in a uniformly thick and flat film on said workpiece,



a handle for moving said applicator over said flat surface, and

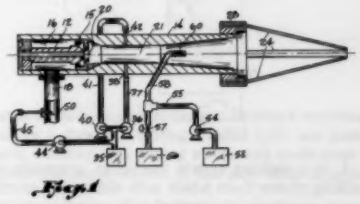
means for rotatably attaching said rod to said handle.

4,476,807

APPARATUS FOR APPLICATION OF ADDITIVES TO CIGARETTE FILTER TOW

James W. Pryor, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Feb. 18, 1983, Ser. No. 468,011
Int. Cl.³ B05B *7/00, 13/06;* A24D *1/04*
U.S. Cl. 118—317 **15 Claims**



1. A jet device for applying an additive to a continuous, multifilament filter tow in connection with the manufacture of filter elements therefrom whicn comprises

(a) a jet tube having entry and exit ends with an elongated passageway substantially circular in cross-sectional shape extending through the tube, said entry and exit ends being adapted to receive and discharge, respectively, said filter tow,

(b) a tubular tow entrance member aligned with and concentrically extending a short distance into the entry end of the jet tube to a termination point and defining an annular chamber between the tubular tow entrance member and the wall of the elongated passageway,

(c) means for introducing a gaseous fluid into said annular chamber and for maintaining a high velocity flow of the gaseous fluid through the jet device in the direction of said exit end of the jet tube,

(d) orifice means transversely positioned in the elongated passageway adjacent to the termination point of the tubular tow entrance member and designed to accommodate passage therethrough of the gaseous fluid and advancing filter tow,

(e) discharge means disposed at the exit end of the jet tube and designed to permit a sudden radially outward movement of the gaseous fluid and filter tow as they emerge from the exit end of the jet tube,

(f) tow confining means associated with said discharge means for limiting the radially outward movement of the filter tow,

(g) primary nozzle means located in said elongated passageway downstream of said orifice means and concentrically positioned with respect to the advancing filter tow so that the primary nozzle means are circumferentially surrounded by the filter tow, and

(h) means for supplying an additive to said primary nozzle means for application of the additive to the filter tow.

4,476,808

DEVICE FOR AUTOMATICALLY RINSING MILKING SYSTEMS

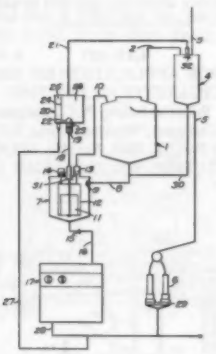
Theodor Meermoller, and Heinrich Gresbof, both of Oelde, Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Feb. 17, 1983, Ser. No. 467,556

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208197

Int. Cl.³ A01J *7/00*

U.S. Cl. 119—14.18 **6 Claims**



1. In a milking system having an automatic rinser and a milking cluster from which milk and rinsing solution is drawn into a constantly vacuumized milk collector which is upstream of a constantly vacuumized sanitary trap during milking and rinsing respectively, a sluice for conveying the milk or the rinsing solution onward and having a float, an outflow line connected to the rinser, a vacuum line and a liquid run-off line between the sluice and the milk collector, means forming an opening to the atmosphere, and two sluice valves activated by the float upon the entry of liquid into the sluice to close the formerly open vacuum line and open the formerly closed opening to the atmosphere, the improvement comprising: a preliminary-run line connecting the rinser and the milking machine, and a preliminary-run container positioned between the sluice and the preliminary-run line and communicating through first and second connecting lines with the preliminary-run and the sanitary trap respectively and through a run-off and a third connecting line with the sluice, the preliminary-run container comprising a first valve mounted in the rub-off and which is normally open while the preliminary-run container is filling and a second valve in the run-off which is only movable to an open position when the sluice becomes vacuumized, thereby effecting the flow of rinsing solution through the third connecting line into the sluice, and wherein the second valve is closed in response to a build up of atmospheric pressure in the sluice, thereby effecting the filling of the preliminary-run collector and the flow of rinsing solution through the second connecting line into the sanitary trap.

4,476,809

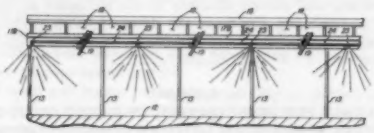
COOLING SYSTEM FOR CATTLE CONFINEMENT PENS

Richard E. Bunger, 5202 E. Washington St., Phoenix, Ariz. 85034

Filed Mar. 1, 1983, Ser. No. 471,196

Int. Cl.³ A01K *1/00*

U.S. Cl. 119—16 **2 Claims**



1. A cooling system for animal confinement buildings comprising:

a plurality of spacedly mounted fans arranged in the building above the animals for blowing air over the backs of the animals confined in the building,

said fans being mounted to oscillate in unison,

a plurality of sprinkler heads connected to a source of water under pressure mounted in the building, one adjacent each of the fans for directing water droplets onto the backs of the animals in the building, and

means for controlling the length of time said sprinkler heads are spraying droplets of water on the backs of the animals in a sequential manner in a given relationship to the temperature of the air in the building,

said sprinkler heads being energized to sprinkle large droplets of water approximately one minute approximately each half hour that the temperature of the air in the building is above a given temperature.

4,476,810

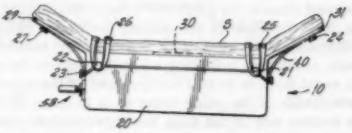
DOG TRAINING DEVICE

Roberto F. Heras, 2122 NW. 24th St., Miami, Fla. 33142

Filed May 31, 1983, Ser. No. 499,298

Int. Cl.³ A01K *15/00*

U.S. Cl. 119—29 **4 Claims**



1. A device for delivering an electric discharge to pets coming into contact with a bait, comprising, in operative combination:

A. an electrically insulated housing having means for supporting the bait in a laterally outward direction from the housing so as to be accessible to the pet;

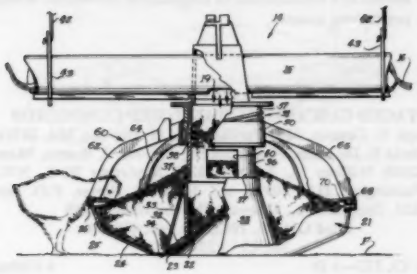
B. circuitry means for generating a high voltage mounted within said housing, including an output with at least two poles, and further including self-contained battery means to supply an electric current to said circuitry means;

C. first electrode means attached to and surrounding the periphery of said housing and connected to one pole of said high voltage circuitry means;

D. second electrode means mounted on the top surface of said housing connecting the other pole of said high voltage circuitry means to the bait so that the electric circuit

between said first and second electrode means may be closed by the pet as the pet bites the bait.

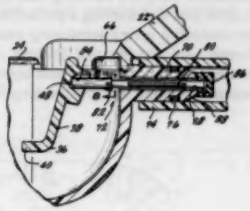
4,476,811
ADJUSTABLE FEEDER WITH BROOD GATE
Ray E. Swartzendruber, Syracuse, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.
Filed Sep. 30, 1982, Ser. No. 428,847
Int. Cl.³ A01K *5/02*
U.S. Cl. 119—52 AF **28 Claims**



1. A feeder for poultry and the like adapted to receive feed from a conveyor and to present the feed, alternatively, to immature poultry and to mature poultry, the feeder comprising, in combination, pan means for retaining and presenting delivered feed, drop tube means adapted to extend from the conveyor to a distal end above the pan means, at least one brood gate opening being defined in the drop tube means above the distal end, and means for alternatively masking and exposing the brood gate opening so as to permit feed flow, when the brood gate opening is exposed, from the conveyor through an upper interior portion of the drop tube means, thence out through the brood gate opening, and thence down the outside of the drop tube means to an outer pan means area for consumption by relatively immature poultry, and to alternatively permit feed flow, when the brood gate opening is masked, from the conveyor through upper and thence lower interior portions of the drop tube means and past the drop tube means distal end, the skirt means distal end and pan means together defining a first feed gate through which feed can pass to an inner pan means area for consumption by relatively mature poultry.

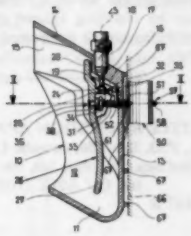
4,476,812
WATERING CUP
Maurice T. Dube; Michael W. Hart, and Warren H. Hart, all of Glendale, Calif., assignors to H. W. Hart Mfg. Co., Glendale, Calif.
Filed Jul. 23, 1982, Ser. No. 401,136
Int. Cl.³ A01K *39/02*
U.S. Cl. 119—75 **23 Claims**

1. In combination for dissipating the thirst of fowl,
a watering cup having a rear wall,
a triggering arm disposed in the cup and mounted for pivotal movement in accordance with the operation of the arm by the fowl,
valve means extending into the cup and operative between a normally closed position and an open position in accordance with the triggering of the triggering arm,
means for channeling water through the valve means in the open position of the valve means, and
means disposed on the triggering arm and responsive to the passage of the water through the valve means for controllably directing the water in a swirling movement along the



rear wall of the cup to clean the rear wall of the cup as the water flows to the bottom of the cup.

4,476,813
AUTOMATIC LIVESTOCK WATERING TROUGH
Adolf Haiges, Bönnigheim, Fed. Rep. of Germany, assignor to Suevia Haiges GmbH & Co., Fed. Rep. of Germany
Filed Mar. 2, 1983, Ser. No. 471,489
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 8205822[U]
Int. Cl.³ A01K *7/06*
U.S. Cl. 119—75 **18 Claims**



1. Apparatus for securing an automatic livestock watering tank to a wall or a standpipe having a radial hole, said automatic livestock watering tank having a rear wall made from a flexible material and having holdes in said rear wall, comprising:
a metal plate arranged on the inside of the rear wall, said metal plate having a perpendicular bolt aligned with a first hole of said automatic livestock watering tank, said bolt being secured to said metal plate and penetrating said first hole in said rear wall of said tank and penetrating into one of said standpipe hole or wall; and
said metal plate further having at least two holes aligned with an equal number of holes in said automatic livestock watering tank and through which aligned holes securing means pass for separably connecting said metal plate to one of said standpipe or wall.

4,476,814
ANIMAL PET MEDICAL COLLAR
Marie Z. Miller, 12983 Montford St., Pacoima, Calif. 91331
Filed Mar. 11, 1983, Ser. No. 474,564
Int. Cl.³ A01K *27/00*
U.S. Cl. 119—106 **4 Claims**

3. An improved animal pet medical collar, said collar comprising, in combination:
(a) a self-supporting, solid foam resilient body having a peripheral, generally annular wall defining a generally central space, adapted to fit around an animals neck, the

opposed ends of said wall collar defining a size adjustment gap and,

(b) releasably adjustable closing and locking means secured to said collar body for securing said opposed wall ends to each other and thus locking a pet animal in said collar; said means including spring tensioning means,

(c) wherein said closing and locking means comprises a drawstring secured to one of said opposed wall ends, said drawstring bridging said gap, passing through the other of

said wall ends to the outer surface of said body and adjustably releasably locked in place thereagainst by said spring tensioning means,

(d) wherein said collar body is resilient and generally doughnut shaped and wherein the free end of said drawstring bears an enlargement which is releasably secured to said collar body by cinching against one of a plurality of spaced walls disposed in a recessed compartment in said collar body.

4,476,815

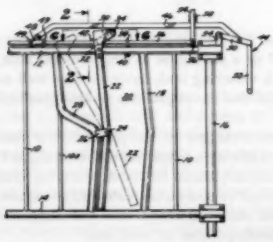
CATTLE STANCHION APPARATUS

Teo Albers, Sr., P.O. Box 156, Artesia, Calif. 90701

Filed Sep. 30, 1982, Ser. No. 431,264

Int. Cl.³ A01K *1/06*

U.S. Cl. 119—147 R **27 Claims**



1. In cattle stanchion apparatus including a fixed stanchion; a release stanchion located adjacent and spaced from said fixed stanchion to define a head opening for an animal; and mounting means mounting said release stanchion for pivotal movement between an open position in which the upper part of said head opening is enlarged to enable an animal to place its head through said head opening, and a closed position in which said head opening is narrowed to hold the animal's head in said head opening, said release stanchion tending to fall into said open position, the improvement comprising:

generally horizontally elongated positioning means including coupler means, said positioning means being longitudinally movable between an extended and a retracted position, and pivotable about a longitudinal axis to orient said coupler means between an engage position and a non-engage position;

latching means carried at the upper extremity of said release stanchion for engaging said coupler means;

locking means operative to pivot said positioning means about said longitudinal axis; and

operator means fixed against pivotal movement about said longitudinal axis and operative to move said positioning means along said longitudinal aixs between said extended position and said retracted position for engaging said latching means and said coupler means in said engage position and for moving said coupler means in said non-engage position past said latching means without engagement thereof whereby said release stanchions are not moved as a consequence of longitudinal movement of said positioning means.

4,476,816

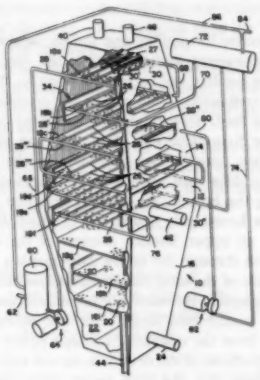
STAGED CASCADE FLUIDIZED BED COMBUSTOR

Joseph N. Cannon, 4103 Farragut St., Hyattsville, Md. 20781; David E. De Lucia, 58 Beacon St., Apt. No. 2, Boston, Mass. 02108; William M. Jackson, 5300 McArthur Blvd., NW., Washington, D.C. 20016, and James H. Porter, P.O. Box 1131, Daggett Ave., Vineyard Haven, Mass. 02568

Filed Oct. 25, 1982, Ser. No. 436,246

Int. Cl.³ F22B *1/02*

U.S. Cl. 122—4 D **9 Claims**



1. A fluidized bed combustor characterized by

A. a confining shell tapered inwardly from an intermediate portion thereof to upper and lower ends thereof,

B. a plurality of vertically separated distributor plates within said shell of cross-section corresponding to the cross-section of the portion of the shell within which they are located and apertured for gas flow therethrough for maintaining a fluidized bed of solid materials thereon,

C. means connecting said distributor plates in sequence for serial flow of solids from one stage to another in vertically descending direction while said combustor is operating,

D. heat transfer tubes associated with each of at least a plurality of said stages and positioned for containment within the fluid bed of its corresponding stage during at least a portion of the operating time of said combustor for heat transfer with said bed,

E. means for feeding sorbent material to an upper stage of said combustor for passage through successive stages in sequence and discharge at a lower stage thereof,

F. means for feeding solid fuel to an intermediate stage of said combustor for combustion therein, the spent residue of said fuel passing to lower stages of said combustor for discharge with said sorbent.

4,476,817

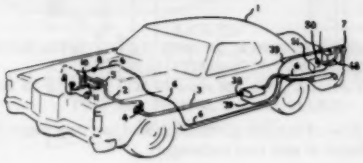
COMBUSTION AND POLLUTION CONTROL SYSTEM

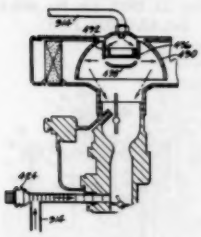
John E. Lindberg, Lafayette, Calif., assignor to Owen, Wickersham & Erickson, P.C., San Francisco, Calif.

Division of Ser. No. 190,932, Sep. 25, 1980, Pat. No. 4,393,817, which is a division of Ser. No. 657,747, Feb. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 613,867, Sep. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 356,589, May 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 227,440, Feb. 18, 1972, abandoned. This application Jul. 14, 1983, Ser. No. 513,991

Int. Cl.³ F02B *43/08, 51/00;* F02D *19/00, 47/00*

U.S. Cl. 123—3 9 Claims





1. A method for providing improved combustion and reduced emissions in an internal combustion engine, having a combustion zone and an exhaust, comprising

feeding both fuel and controlled amounts of steam into said combustion zone via an ultrasonic generator and subjecting it there to ultrasonic treatment,

and

in response to engine needs, increasing the weight ratio of said aqueous fluid to said fuel during engine acceleration.

4,476,818

CONSTANT AIR FEED ALCOHOL DISSOCIATION PROCESS FOR AUTOMOBILES

Heeyoung Yoon, McMurray, Pa., assignor to Conoco Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 414,744, Sep. 3, 1982, Pat. No. 4,425,876. This application Oct. 19, 1983, Ser. No. 543,542

Int. Cl.³ F02M *27/02*

U.S. Cl. 123—3 8 Claims

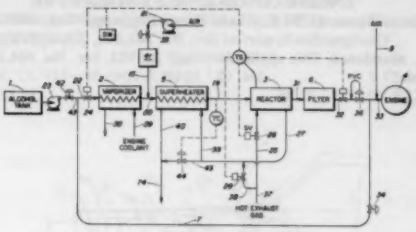
1. A method of fuel treatment and distribution for an internal combustion engine comprising the sequence of steps as follows:

(a) heating a catalyst bed reactor to a start-up temperature using exhaust gas from an internal combustion engine being operated on atomized alcohol; said catalyst bed comprising a partial combustion catalyst and an alcohol dissociation catalyst;

(b) vaporizing liquid alcohol to form alcohol vapor;

(c) mixing said alcohol vapor with a fixed flow rate of air to form a partial combustion mixture, said flow rate being substantially fixed at about the flow rate required for adiabatic dissociation of said alcohol vapor at the flow rate of said alcohol vapor during idling of said internal combustion engine;

(d) contacting said partial combustion mixture and said



partial combustion catalyst and said dissociation catalyst to form a hydrogen-rich fuel;

(e) mixing air and said hydrogen rich fuel to form a total combustion mixture;

(f) burning said total combustion mixture in an internal combustion engine.

4,476,819

FUEL ECONOMY DEVICE

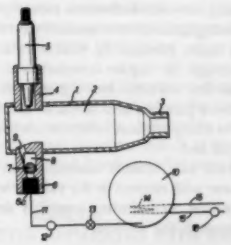
David T. Szloboda, 10640 Skagit Dr., Richmond, British Columbia, Canada V7E 2A2

Filed Mar. 8, 1983, Ser. No. 473,269

Claims priority, application Canada, Mar. 15, 1982, 398383

Int. Cl.³ F02D *19/00*

U.S. Cl. 123—25 C 10 Claims



1. An engine system comprising a fuel economy device, the fuel economy device comprising a body formed to define an elongate chamber, the body having at one end an externally screw threaded neck portion for screwing into a spark plug aperture of an engine, and the body having at its other end an internally screw threaded aperture which communicates with the chamber and which is for receiving a conventional spark plug and an inlet pipe which communicates with the chamber and which includes a non-return valve provided to facilitate the introduction of water into the chamber and to resist the flow of gas from the chamber, the non-return valve having a floating ball obturator, and the engine system further comprising a water tank coupled to the inlet pipe which includes the non-return valve, a flow control valve adjustable for providing a predetermined flow of water from the water tank to the chamber, an ON/OFF valve operative to control the flow of water to the chamber, and a thermostat responsive to engine operating temperature for opening the ON/OFF valve when a predetermined engine operating temperature is reached, the fuel economy device being such that it is screwable into the spark plug aperture of the engine in place of the conventional spark plug with the conventional spark plug then being

screwed into the internally screw threaded aperture in the body of the fuel economy device.

4,476,820

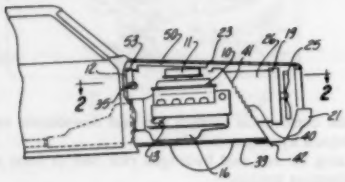
ENGINE COMPARTMENT STRUCTURE

John Nixon, 11795 E. Grand River, Brighton, Mich. 48116

Continuation-in-part of Ser. No. 281,008, Jul. 6, 1981, abandoned. This application Aug. 2, 1982, Ser. No. 404,319

Int. Cl.³ F01P *7/10*

U.S. Cl. 123—41.05 **16 Claims**



1. For use in conjunction with a vehicle having an engine compartment having a forward and rearward end and in which an engine is contained, a device for maintaining the temperature of the engine compartment between predetermined upper and lower limits comprising:

means for substantially enclosing said engine in said engine compartment,

means for recirculating air within the engine compartment whenever the temperature of the engine compartment is less than said lower limit,

said enclosing means comprising a shutter assembly positioned forwardly of the engine, said shutter assembly being movable between a closed position in which air flow through said shutter assembly is substantially blocked, and an open position in which exterior air flows into and through the engine compartment,

means for variably moving said shutter assembly from its closed position and towards its open position as said engine compartment temperature increases above said upper limit and

wherein said shutter assembly lies in a forwardly angled plane with respect to the vehicle so that, when in its closed position, said shutter assembly deflects incoming air underneath the vehicle.

4,476,821

ENGINE

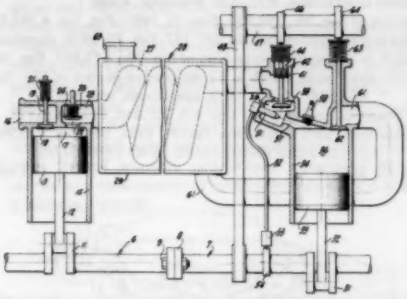
Thomas C. Robinson, 100 Hill Rd., Berkeley, Calif. 94708, and Sotiris Kitrilakis, 33 Roble Rd., Berkeley, Calif. 94705

Filed Dec. 15, 1982, Ser. No. 449,860

Int. Cl.³ F02B *33/00*

U.S. Cl. 123—68 **8 Claims**

1. An engine comprising a cylinder having a head, a piston reciprocable within said cylinder toward and away from said head, means defining an antechamber in said head and spaced from said cylinder, a source of compressed air, means for conducting compressed air from said source to said antechamber, a timed inlet valve opening into said antechamber for controlling flow of said compressed air through said conducting means into said antechamber, a duct having an axis and opening at one end to said antechamber and at the other end opening into said cylinder, an injector in said antechamber and effective while said inlet valve is open for injecting fuel along said axis into said tube in an axial direction, a heat exchanger in heat exchange relationship with said compressed air conducting means, means for carrying exhaust gas from said cylinder to said heat exchange means, and a timed exhaust valve con-



trolling flow of exhaust gas through said carrying means from said cylinder to said heat exchanger.

4,476,822

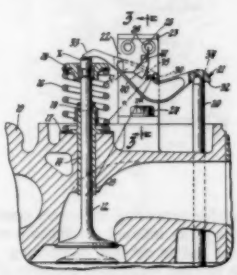
HYPOCYCLIC ROLLING CONTACT ROCKER ARM AND PIVOT

Duane J. Bonvallet, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 23, 1983, Ser. No. 496,930

Int. Cl.³ F02L *1/18*

U.S. Cl. 123—90.41 **3 Claims**



1. A reciprocating internal combustion engine of the type having an engine block defining a cylinder with a port, a valve located for axial movement in said port and biased to a predetermined position, a valve actuator spaced from the valve and operable to effect reciprocation of the valve, and a valve train means including a rocker arm in engagement with the valve and the valve actuator and actuated in rocking movement to reciprocate said valve against said bias to open and close the port for engine operation, the improvement comprising:

fulcrum means defining a fixed rocking support intermediate the length of the rocker arm, said fulcrum means and said rocker arm defining a pair of cooperating outer and inner cylindrical bearing surface contours respectively, carrying the reaction forces of rocker arm pivotal movement, the radius of the outer conformation being substantially two times the radius of the inner conformation, with the center of revolution of the outer conformation being located on the operating axis of said valve, the inner conformation of said rocker arm being located such that an extension thereof will intersect the contact point of said rocker arm on the axis of said valve at the free end thereof;

restrainer means to anchor the cooperating cylindrical conformations for substantially rolling action in relation to each other, said restrainer means comprising a retainer pin means extending outward from the inner conformation

and a slot means in the fulcrum means of a size to receive said pin,

said retainer pin means having opposed semi-cylindrical surfaces defined by circles whose centers of revolution are located on the curved plane of said inner conformation and each said slot means having inclined straight wall guide surfaces over which the associated said retainer pin means slides during rocker arm oscillation,

whereby within the range of rocker arm oscillation said retainer pin means establishes substantially rolling contact between the cylindrical surfaces by contact with the guide surfaces of the recess.

4,476,823

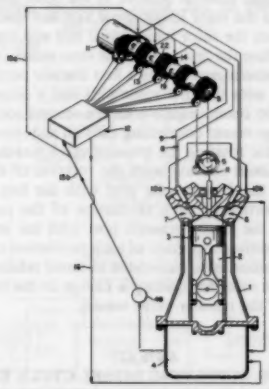
HYDRAULIC VALVE TIMING CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

John K. Williams, 4121 Cascade Rd., SW., Atlanta, Ga. 30331

Filed Aug. 31, 1982, Ser. No. 413,520

Int. Cl.³ F01L *1/34*

U.S. Cl. 123—90.12 **9 Claims**



1. A device for controlling the timing of the intake and exhaust valves of an internal combustion engine, said device comprising:

(1) separate valve actuator means for opening and closing each of said intake and exhaust valves;

(2) a pair of actuator pump means connected to each valve actuator means, for supplying controlled timed pulses of pressurized fluid under constant static pressure thereto to open and close respectively said valves;

(3) each of said actuator pump means comprising a piston slidingly disposed within a cylinder and mounted to periodically engage cam lobe means for depressing said piston to thereby provide said timed pulse of fluid;

(4) rotating shaft means turned by said engine; each of said caim lobe means being separately mounted on a planet gear carrier disposed concentrically about said rotating shaft means;

(5) planet gears mounted on said gear carrier and engaging a sun gear mounted on and turned by said rotating shaft means, said planet gears also engaging the inner portion of a ring gear disposed concentrically and outside of said sun gear; said ring gear engaging on its outer periphery means for controllably rotating the ring gear to thereby alter the position of said cam lobe means mounted thereon relative to said piston, thereby to alter the intervals relative to the rotation of said rotating shaft means at which said cam lobe means engages said piston and provides pulses of fluid to said valve actuator means.

4,476,824

MECHANICAL CONTROL ELEMENT HAVING WEAR-RESISTANT SURFACE

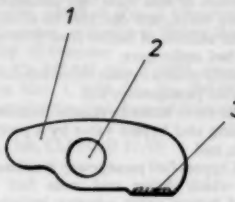
Friedhelm Reinke, Oelingrath 19, 5630 Remscheid, and Friedhelm Emde, Jung-Stilling-Str. 6, 5609 Hückeswagen, both of Fed. Rep. of Germany

Filed Nov. 6, 1981, Ser. No. 318,801

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3044477

Int. Cl.³ F01L *1/18*

U.S. Cl. 123—90.39 **9 Claims**



1. A mechanical control element formed by the following process:

casting an iron element in a desired shape;

preheating the iron element to a temperature up to about the Ms temperature of the iron element to adjust its total hardness;

partially melting a surface region of the control element; and

subsequently cooling the partially melted surface region to form a fine-grained, essentially ledeburitic structure which has a mixed crystal structure that is at least partly martensitic and has a mixed hardness of at least 670 Hv.

3. A method for forming a mechanical control element comprising the following steps:

casting an iron element in a desired shape;

preheating the iron element to a temperature up to about the Ms temperature of the iron element to adjust its total hardness;

partially melting a surface region of the control element; and

subsequently cooling the partially melted surface region to form a fine-grained, essentially ledeburitic structure which has a mixed crystal structure that is at least partly martensitic and has a mixed hardness of at least 670 Hv.

4,476,825

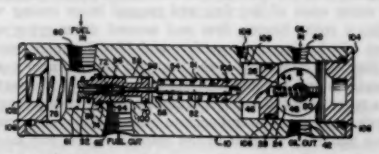
ENGINE PROTECTIVE APPARATUS WITH REMOTE OVERRIDE

J. T. Mills, Houston, Tex., assignor to Sentinel Manufacturing Company, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 296,193, Aug. 25, 1981, Pat. No. 4,399,785. This application Jun. 7, 1983, Ser. No. 501,828

Int. Cl.³ F02B *77/08*

U.S. Cl. 123—198 DB **21 Claims**



1. An apparatus for controlling the flow of fuel in a fuel supply line of an internal combustion engine in response to pressure in the engine's lubricating system and comprising:

(a) a main body having a main fuel passageway therein:

(b) a fuel inlet port and a fuel outlet port, each port communicating with said main fuel passageway and adapted to be

connected to the fuel supply line of an internal combustion engine;

(c) a lubricant pressure sensor for sensing the pressure in the engine's lubricating system;

(d) a main valve in said main fuel passageway for controlling the normal flow of fuel between said fuel inlet port and said fuel outlet port, said main valve closing when the lubricant pressure sensor indicates that the pressure in the engine's lubricating system is below a predetermined value P1;

(e) a bypass fuel passageway in said main body, bypassing that portion of said main fuel passageway controlled by said main valve, and operable to allow a predetermined restricted amount of fuel to flow from said fuel inlet port to said fuel outlet port;

(f) a normally closed bypass valve selectively blocking said bypass fuel passageway; and

(g) a bypass valve actuator remote from said main body and controlling said bypass valve by a pressurized fluid control line; and

wherein said bypass fuel passageway is at least partly outside of boundaries which define said main fuel passageway, and wherein said bypass valve actuator includes a spring-biased actuating piston operable to place fluid in said control line under pressure, and said bypass valve is operated by a spring-biased bypass piston disposed at least partly outside said main body, and wherein said actuating piston is operable to open said bypass valve by moving said bypass piston.

4,476,826

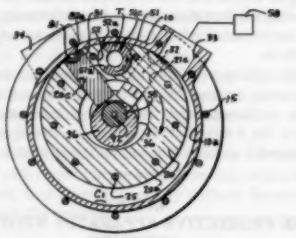
VANE TYPE ROTARY INTERNAL COMBUSTION ENGINE WITH TRANSFER VALVE IN ROTOR

William R. Stephens, Rockton, Ill., assignor to William R. and Zella B. Stephens Trust, Rockford, Ill.

Filed Sep. 29, 1982, Ser. No. 428,380

Int. Cl.³ F02B *53/08*

U.S. Cl. 123—235 **11 Claims**



1. A rotary internal combustion engine comprising, a stationary casing having endwise aligned first and second inner casing wall portions of circular cross-section and like diameter with their longitudinal centers aligned along a casing longitudinal axis, an intermediate wall means between the first and second inner casing wall portions and first and second end wall means at the outer ends of the first and second inner casing wall portions, a rotor having first and second outer rotor wall portions of circular cross-section and like diameter respectively disposed internally of the first and second inner casing wall portions and mounted for rotation in a motor direction about a rotor longitudinal axis eccentric to the casing longitudinal axis with the first and second outer rotor wall portions disposed generally tangent to the respective first and second inner casing wall portions at a casing tangent location to provide crescent shaped first and second chambers therebetween, a single first vane means mounted on the rotor for rotation therewith and for sliding movement relative thereto in a direction generally radially of the rotor to extend outwardly from the first outer rotor wall portion and slidably engage the first inner casing wall portion, a single second vane means mounted on the rotor for rotation therewith and for sliding movement relative thereto in a direction generally radially of the rotor to extend outwardly from the second outer rotor wall portion and slidably engage the second inner casing wall portion, the first and second vane means on the rotor being angularly spaced apart about the axis of the rotor at an acute angle with the second vane means being angularly advanced in the direction of rotation of the rotor relative to the first vane means, inlet port means in the casing communicating with the first chamber, exhaust port means in the casing communicating with the second chamber, said intake and exhaust ports being respectively formed in said first and second inner wall casing portions at relatively opposite sides of the casing tangent location and angularly spaced apart about the longitudinal casing axis at an acute angle, the rotor having first rotor port means in the first outer rotor wall portion at a location on the rotor angularly spaced in said motor direction from said first vane means and communicating with the first chamber and second rotor port means in the second outer rotor wall portion at a location on the rotor angularly spaced in a direction opposite said motor direction from the second vane means and communicating with the second chamber, transfer valve means mounted on the rotor for rotation with the rotor about the rotor longitudinal axis and for axial rotation relative to the rotor about a valve axis parallel to the rotor longitudinal axis and spaced radially outwardly from the rotor longitudinal axis and located angularly intermediate the first and second vane means on the rotor, the transfer valve means having a first transfer port adapted to communicate with the first rotor port and a second transfer port adapted to communicate with the second rotor port and transfer passage means connecting the first and second transfer ports, means for rotating the transfer valve means relative to the rotor in timed relation with the rotation of the rotor to communicate the first transfer port with the first rotor port during one portion of each revolution of the rotor and to communicate the second transfer port with the second rotor port during a different portion of each revolution of the rotor, and engine ignition means operated in timed relation with the rotation of the rotor for igniting a charge in the transfer passage means of the transfer valve means.

4,476,827

PLANT FOR SUPPLYING DIESEL CYCLE ENGINES WITH DIESEL OIL AND WITH A MIXTURE OF DIESEL OIL AND GAS

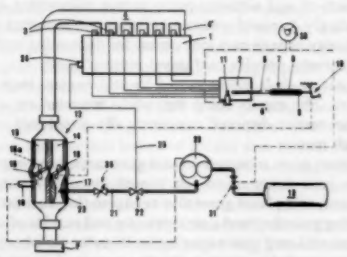
Rubens Basaglia, Galliera, and Ezio Bollina, Bologna, both of Italy, assignors to B & b Bologna di Basaglia Rubens e Bollina Ezio s.n.c., Bologna, Italy

Filed Jan. 21, 1983, Ser. No. 459,965

Claims priority, application Italy, May 20, 1982, 3249 A/82; Oct. 15, 1982, 3561 A/82

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—276 **14 Claims**



1. A plant for supplying diesel cycle engines with diesel fuel or a mixture of diesel and gaseous fuel comprising a device for interrupting the travel of an injection pump control lever, the control lever being connected to an accelerator, a mixer group

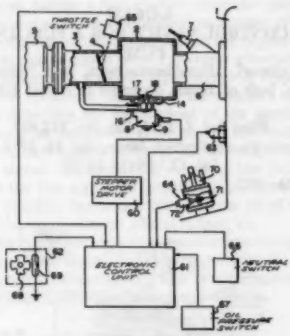
placed on a manifold for the induction of air to the engine, the mixer comprising two parallel pipes, the first pipe being provided with a first throttle valve movable between an open and closed position, the second tube having a Venturi tube connected to a supply of gaseous fuel and a second throttle valve movable continuously and connected to the accelerator, the pipes being jointly provided with an air passage area at least identical to that required for maximum engine air induction, the first throttle valve being controlled by an actuator independently of the second throttle, the first throttle being in the fully open position and the second throttle in the closed position when the engine is to run solely on diesel fuel and the first throttle is in a closed position when the engine is to run on a mixture of diesel and gaseous fuel, the second throttle controlling the engine speed by incremental opening of the valve.

4,476,828

METHOD AND APPARATUS FOR CONTROLLING THE IDLING SPEED OF AN ENGINE

Nobuyuki Kobayashi, Toyota, and Hiroshi Ito, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 27, 1981, Ser. No. 287,119
Claims priority, application Japan, Jan. 23, 1981, 56-8141
Int. Cl.³ F02D 11/10
U.S. Cl. 123—339 **14 Claims**



1. A method of controlling the idling speed of an engine having a main intake passage, a throttle valve arranged in the main intake passage, a bypass passage branched off from the main intake passage upstream of the throttle valve and connected to the main intake passage downstream of the throttle valve, a control valve arranged in the bypass passage, and a stepper motor actuating the control valve for controlling the amount of air flowing within the bypass passage, wherein said method comprises the steps of:

comparing the idling speed to upper and lower predetermined limits of engine speed;

rotating the stepper motor in a direction wherein the flow area of the control valve is reduced when the idling speed of the engine is greater than said predetermined upper limit of the idling speed for decreasing the idling speed below said predetermined upper limit;

rotating the stepper motor in a direction wherein the flow area of the control valve is increased when the idling speed of the engine is less than said predetermined lower limit of the idling speed for increasing the idling speed above said predetermined lower limit;

detecting the condition of an automatic transmission;

selecting one set of said upper and lower limits when the automatic transmission is in a neutral range, and selecting a different set when the automatic transmission is in a drive range;

measuring the temperature of the coolant of the engine;

maintaining said upper limit and said lower limit constant when the temperature of the coolant of the engine is greater than a predetermined temperature; and

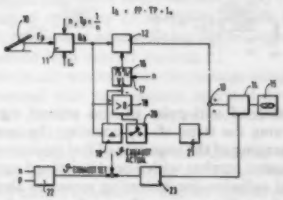
decreasing the difference between said upper limit and said lower limit as the temperature of the coolant of the engine increases when the temperature of the coolant of the engine is less than said predetermined temperature.

4,476,829

ELECTRONIC CONTROL SYSTEM FOR THE FUEL QUANTITY OF AN INTERNAL COMBUSTION ENGINE HAVING SELF-IGNITION

Max Straubel, Stuttgart, and Wolf Wessel, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 415,216, Sep. 7, 1982, abandoned. This application Mar. 7, 1984, Ser. No. 586,643
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149095
Int. Cl.³ F02D 31/00
U.S. Cl. 123—357 **9 Claims**



1. An electronic control system for regulating the fuel quantity in an internal combustion engine having self-ignition and a final control element in accordance with the driving pedal position, rpm and exhaust gas temperature, comprising

means for determining the fuel quantity in dependence on the driving pedal position and the rpm,

means for providing a predetermined load threshold,

means for limiting the function of said fuel quantity above said load threshold, thereby delaying an increase in fuel quantity, and

means for limiting the fuel quantity to said final control element in accordance with the exhaust gas temperature.

4,476,830

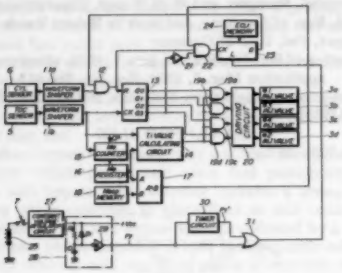
FUEL INJECTION CONTROL METHOD FOR A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE, HAVING A FAIL SAFE FUNCTION FOR ABNORMALITY IN CYLINDER-DISCRIMINATING MEANS

Shumpei Hasegawa, Niiza, and Shigeo Umesaki, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1983, Ser. No. 521,246
Claims priority, application Japan, Aug. 13, 1982, 57-140763
Int. Cl.³ F02D 17/00
U.S. Cl. 123—479 **6 Claims**

1. A method for controlling the injection of fuel into an internal combustion engine having a plurality of cylinders, pistons disposed within respective ones of said cylinders, a crankshaft to which said pistons are connected, crank angle position-detecting means for detecting predetermined positions of said pistons within said respective ones of said cylinders and generating pulses as a first signal indicative of detected predetermined positions of said pistons, and cylinder-discriminating means adapted to generate a pulse as a second signal each time said crankshaft of said engine rotates through a predetermined angle with respect to a predetermined position of one of said pistons within a particular one of said cylinders, wherein fuel is injected into said cylinders in predetermined sequence starting

from a fuel injection into said particular one of said cylinders, in synchronism with pulses successively generated from said crank angle position-detecting means immediately after generation of each pulse of said cylinder-discriminating means, the sequence of fuel injections into said cylinders being changed so as to first effect fuel injection into said particular one of said cylinders immediately after generation of a pulse of said second signal and thereafter effect fuel injections into the other cylinders in said predetermined sequence when one of said cylinders which corresponds to a first pulse of said first signal is other than said particular one of said cylinders immediately after



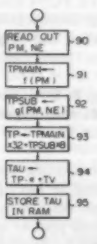
generation of said pulse of said second signal, the method comprising the steps of: (1) counting the number of times of said changing of the sequence of fuel injections and comparing the counted number with a predetermined number; (2) regarding said cylinder-discriminating means as abnormal when the counted number reaches the predetermined number; and (3) effecting fuel injections into said cylinders in said predetermined sequence in synchronism with pulses of said first signal alone, irrespective of generation of subsequent pulses of said second signal, when said cylinder-discriminating means is regarded as abnormal in said step (2).

4,476,831

METHOD AND APPARATUS FOR CONTROLLING THE FUEL SUPPLY OF AN INTERNAL COMBUSTION ENGINE

Kazuo Shinoda, Toyota, and Toshiaki Isobe, Nagoya, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 22, 1983, Ser. No. 477,852
Claims priority, application Japan, Mar. 24, 1982, 57-045547
Int. Cl.³ F02D *5/00*
U.S. Cl. 123—480 **14 Claims**



1. A method of controlling the fuel supply of an internal combustion engine comprising the steps of:

detecting an intake manifold pneumatic pressure to produce a first electrical signal;

detecting an engine running speed to produce a second electrical signal;

calculating, in response to said first electrical signal, a first fuel supply amount, said calculation being performed by multiplying a one-dimensional function of the detected intake manifold pneumatic pressure by a first weighting factor;

calculating, in response to said first and second electrical signals, a second fuel supply amount, said calculation being performed by multiplying a two-dimensional function of the detected intake manifold pneumatic pressure and of the detected engine running speed by a second weighting factor which is smaller than said first weighting factor;

calculating a third fuel supply amount by totalling said calculated first fuel supply amount and said calculated second fuel supply amount; and

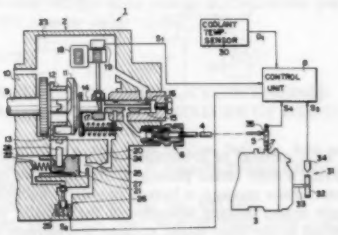
adjusting, depending upon said calculated third fuel supply amount, the actual fuel supply to the engine.

4,476,832

TIMING CONTROL DEVICE FOR A FUEL INJECTION PUMP

Kyoichi Fujimori, Higashimatsuyama, and Masami Okano, Kawagoe, both of Japan, assignors to Diesel Kiki Co., Ltd., Japan

Filed Jul. 8, 1983, Ser. No. 512,407
Claims priority, application Japan, Jul. 16, 1982, 57-122829
Int. Cl.³ F02M *59/20*
U.S. Cl. 123—502 **8 Claims**



1. A timing control device for a fuel injection pump, which has a hydraulic type timer for operating a member for adjusting the injection advance of the fuel injection pump of an internal combustion engine and is arranged in such a manner that the injection advance is adjusted in accordance with the duty ratio of a driving pulse signal applied to a timing valve of said hydraulic type timer, said device comprising:

a first means for producing a first signal indicative of the rotational speed of said fuel injection pump;

a second means for producing a second signal indicative of the duty ratio of said driving pulse signal necessary for obtaining the optimum injection advance at each instant in accordance with the operating conditions of said internal combustion engine and said fuel injection pump; and

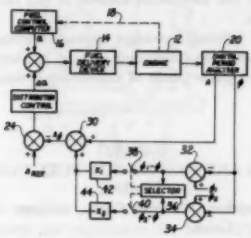
a signal generator for generating said driving pulse signal, said signal generator being arranged in such a way that the frequency of said driving pulse signal is controlled in accordance with said first signal so as not to give rise to resonation during the operation of said timer and the duty ratio is controlled in accordance with said second signal.

4,476,833

PHASE ANGLE MODIFICATION OF THE TORQUE AMPLITUDE FOR FUEL DISTRIBUTION CONTROL SYSTEMS

Edwin A. Johnson, Clarkston, and Chun K. Leung, Bloomfield Hills, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Oct. 21, 1982, Ser. No. 435,835
Int. Cl.³ F02B 3/00; F02P 5/04
U.S. Cl. 123—436 22 Claims



1. An improved fuel distribution system for an internal combustion engine having a fuel control computer generating fuel signals in response to the operational parameter of the engine, a fuel delivery system delivering fuel to the engine in response to the fuel signals, a digital period analyzer generating a torque amplitude signal and a phase angle signal in response to the instantaneous rotational velocity of the engine's output member, means detecting the fluctuations of the amplitude signal for generating an amplitude error signal, distribution control responsive to said amplitude error signal for generating a fuel correction signal, and means for summing the fuel correction signal with the fuel signal for generating corrected fuel signal tending to equalize the torque output from all of the engine's cylinders, the improvement characterized by:

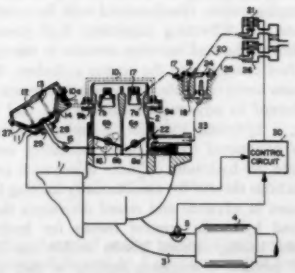
amplitude signal correction means for correcting the amplitude signal for timing errors in response to the phase angle signal being smaller than a first predetermined value and larger than a second predetermined value.

4,476,834

AIR-FUEL RATIO CONTROL SYSTEM

Kazuo Nakazato, Fuchu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo and Nissan Motor Company, Limited, Yokohama, both of, Japan

Filed May 26, 1982, Ser. No. 382,457
Claims priority, application Japan, May 29, 1981, 56/82874
Int. Cl.³ F02B 3/00
U.S. Cl. 123—440 7 Claims



1. In an air-fuel ratio control system for an internal combustion engine having a two-barrel carburetor with primary and secondary intake passages, primary and secondary venturis in said intake passages, a throttle valve in the primary intake passage, an exhaust passage, an O_2 sensor for detecting the concentration of a constituent of exhaust gases passing through said exhaust passage, an on-off electromagnetic valve for correcting the air-fuel ratio of the air-fuel mixture supplied by said two-barrel carburetor, the improvement which comprises

an electronic control circuit comprising

a closed loop feedback control circuit comprising a comparator for comparing an output signal of said O_2 sensor with a reference value, a proportional and integrating circuit operatively connected to said comparator, and a driving circuit means for producing driving pulses for driving said electromagnetic valve in dependency on a signal fed thereto, said driving circuit means operatively receiving and driving said electromagnetic valve in dependency on an output signal of said proportional and integrating circuit for controlling the air-fuel ratio to a value approximate to the stoichiometric air-fuel ratio, and

a fixed signal generating circuit means for supplying a rich air-fuel ratio signal to said driving circuit means,

detecting means comprising a vacuum operated device having a diaphragm responsive to the vacuum at said venturis, for detecting a condition of operation of said internal combustion engine and producing a detected signal upon a predetermined high venturi vacuum,

a throttle valve in said secondary intake passage being operatively connected with said vacuum operated device for actuating the throttle valve in dependency on said high venturi vacuum, and

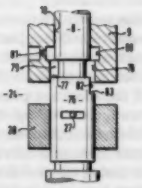
switch means for being operated by said detected signal of said detecting means for rendering said closed loop feedback control circuit inoperative and for operatively feeding said fixed signal to said driving circuit means, whereby a rich ratio of the air-fuel mixture is supplied.

4,476,835

METHOD FOR DELAYING AXIAL MOVEMENT OF A PUMP PISTON IN A FUEL INJECTION PUMP FOR COMBUSTION ENGINES, AND FUEL INJECTION PUMP FOR COMPLETING THE PROCESS

Helmut Laufer, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,954
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1981, 3144277
Int. Cl.³ F02M 57/02, 59/34
U.S. Cl. 123—467 8 Claims



1. A fuel injection pump for internal combustion engines having at least one pump piston performing alternating suction strokes and turns within a cylindrical bore, a suction chamber, a pump work chamber and at least one injection line connectable to said pump work chamber during an injection period of the turn, said pump work chamber being connectable with said suction chamber for cut-off of the fuel injection and completion of the injection period during the turn of said piston pump, a fuel-filled damping chamber whose volume during a turn of said pump piston is reduced by the stroke of said pump piston, at least one throttling point positioned in a connection between said damping chamber and said suction chamber, whereby said

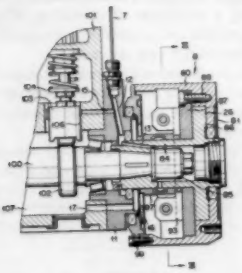
connection is opened no later than upon completion of said injection period, and wherein said work chamber functions as said damping chamber facing an axial blind bore in said pump piston, a throttling pintle extending into said pump work chamber in a coaxial direction to said blind bore, whereby upon completion of the injection period of a turn of said pump piston said bore is opened at its end in the direction of said suction chamber and no later than upon completion of said injection period said bore surrounds said throttling pintle between whose circumference and said blind bore wall said throttling point is formed.

4,476,836

FUEL-INJECTING APPARATUS

Nizo Enomoto, Chita, and Fumiaki Murayama, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 5, 1983, Ser. No. 455,827
Claims priority, application Japan, Jan. 11, 1982, 57-2069
Int. Cl.³ F02M *59/20*
U.S. Cl. 123—502 **4 Claims**



1. Fuel-injecting apparatus for supplying fuel to an internal combustion engine at a timing and at a rate adapted for its operation, said internal combustion engine including cylinders, a shaft and a first lubricant trap provided at the bottom of said internal combustion engine to collect lubricant for lubricating said internal combustion engine and means for supplying the lubricant held in said first lubricant trap to a fuel-injection apparatus, said fuel-injecting comprising:

a fuel pump adapted to be driven by the internal combustion engine to inject fuel into the cylinders of said engine at a prescribed rate and being provided with a section to be lubricated by said lubricant;

a fuel-injection timing control device provided between said lubricant supply means and fuel pump to receive lubricant from said lubricant supply means for controlling the timing in which the fuel pump injects fuel in accordance with the magnitude of the lubricant pressure;

a first lubricant passage extending through said lubricant supply means and fuel-injection timing control device for supplying lubricant from said lubricant supply means to the fuel-injection timing control device;

a second lubricant passage, one end portion of which communicates with the first lubricant passage, and the other end of which faces the lubricated section of the fuel pump, for conducting lubricant from said lubricant supply means to the lubricated section of the fuel pump;

a throttling section formed in the second lubricant passage to prevent a drop in the pressure of lubricant delivered from said lubricant supply means even when said lubricant is supplied to the lubricated section of the fuel pump, wherein

said fuel-injection timing control device controls the timing in which the fuel pump injects fuel by changing the rotation angle phase of the shaft of the internal combustion engine and that of the fuel pump in accordance with the magnitude of the pressure of lubricant delivered from the lubricant supply means, wherein

said fuel pump includes:

a pump shaft rotated by the internal combustion engine,

at least one eccentric cam mounted on said pump shaft,

a tappet pressed against said eccentric cam to be reciprocated by the rotation of said fuel pump shaft,

a pump housing provided with a guide plane allowing for the reciprocation of said tappet, wherein

said eccentric cam and tappet are pressed against each other at the lubricated section of the fuel pump; and, wherein

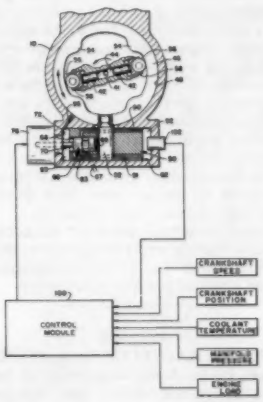
said second lubricant passage extends through the pump housing, and the other end of said lubricant passage is open to the guide plane of said pump housing.

4,476,837

METHOD AND SYSTEM FOR FUEL INJECTION TIMING

Daniel E. Salzgeber, Windsor, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Dec. 7, 1982, Ser. No. 447,535
Int. Cl.³ F02M *59/20*
U.S. Cl. 123—502 **23 Claims**



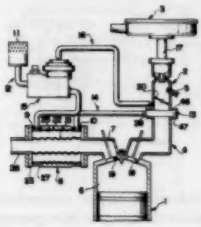
1. A method of timing a fuel injection system of an internal combustion engine having a fuel injection pump driven by the engine and a fuel injection nozzle for each engine cylinder; the fuel injection pump having fuel pumping means, synchronized means, including pump actuating means for periodically actuating the pumping means, synchronized with the internal combustion engine for delivering respective high pressure fuel injection pulses to the fuel injection nozzles in succession for injection of fuel charges into the engine cylinders, the pump actuating means being shiftable in advance and retard opposite directions thereof to advance and retard the fuel injection pulse timing, a hydraulic cylinder, a timing control piston mechanically connected to the pump actuating means and shiftable within the hydraulic cylinder in advance and retard opposite directions thereof for mechanically shifting the pump actuating means in advance and retard directions thereof respectively, and hydraulic control means for hydraulically positioning the timing control piston within the hydraulic cylinder; the method comprising sensing in said hydraulic cylinder a reaction hydraulic pulse to the actuation of the fuel pumping means by the pump actuating means and generating an electrical fuel injection pulse timing signal for said reaction pulse for timing the fuel charge injection.

4,476,838

EXHAUST GAS SUPPRESSOR

Masafumi Fukumoto, Amagasaki, Japan, assignor to Nissin Jabara Industries Co., Ltd., Amagasaki, Japan

Filed Aug. 25, 1983, Ser. No. 526,299
Claims priority, application Japan, Dec. 17, 1982, 57-222659
Int. Cl.³ F02M 23/14
U.S. Cl. 123—556 12 Claims



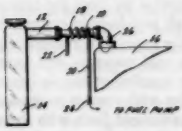
1. An exhaust gas suppressor for internal combustion engines, comprising a heater in the form of a double tube construction connected downstream of the exhaust manifold of the internal combustion engine for heating the secondary air by the heat of exhaust gases in said manifold, a secondary air introducing tube opening at one end thereof to the atmosphere through an air filter and connected at the other end thereof to one of the air inlets and exhaust ports for secondary air of said heater, a heated secondary air feed tube connected at one end thereof to the other air inlet and to the exhaust port for secondary air of said heater and communicating at the other end thereof with the suction manifold for supplying secondary air heated by said heater to a mixture of primary air and fuel prepared by the carburetor, an eddy generating device disposed in the suction manifold and connected to the other end of said heated secondary air feed tube for eddying said primary air-fuel mixture and heated secondary air added thereto, and an air control valve placed between the ends of said secondary air introducing tube for controlling the amount of heated secondary air to be supplied in relation to the amount of said mixed gas.

4,476,839

FUEL PRE-HEATER

Norman C. Niblett, 1203 Lockwood Cir., Salisbury, Md. 21801

Continuation of Ser. No. 196,921, Oct. 14, 1980, abandoned.
This application Feb. 9, 1982, Ser. No. 347,348
Int. Cl.³ F02M 31/00
U.S. Cl. 123—557 2 Claims



1. In a liquid-cooled engine having a radiator and an engine block connected thereto by a coolant conduit forming a coolant path, and having a fuel line for conveying fuel from a fuel pump to said engine for combustion, the improvement comprising:

(a) metallic tube means inserted in said coolant path between said radiator and said engine block so as to cause coolant to flow through said tube; and

(b) metallic fuel conduit means insert in said fuel line between said fuel pump and said engine, said fuel conduit means having a first end to which the fuel is fed from said fuel pump and a second end from which the fuel flows to the Engine;

(c) said fuel conduit means including multiple convolutions shaped in a generally helical manner disposed around the outside of said tube means and in direct contact therewith; and

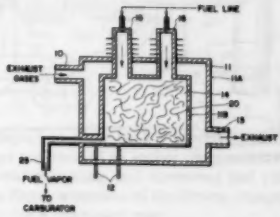
(d) the last convolution of said helical fuel tube said second end extending through said coolant tube so as to be in direct contact with the coolant in said tube.

4,476,840

EVAPORATION CHAMBER FOR FUEL DELIVERY SYSTEMS

Xavier B. Budnicki, Edison, N.J., and Barbara A. Budnicki, executrix, 117 Livingston Ave., Edison, N.J. 08817

Filed Jun. 4, 1982, Ser. No. 385,071
Int. Cl.³ F02M 31/00
U.S. Cl. 123—557 1 Claim



1. An improved evaporation chamber for a fuel system in an internal combustion engine for vaporizing fuel prior to introduction of the same into the carburetor, by heating the fuel with engine exhaust gases, comprising:

an outer hollow housing having an inlet port for receiving exhaust gases and an output port for discharging said exhaust gases, with said inlet port positioned above said outlet port and in an opposite side of said housing to cause a turbulence of gas flow, with the surface of said outer housing having a network of heat conducting fins emanating therefrom into the exhaust gases and exteriorly of the housing.

an inner hollow housing located in the hollow of said housing and in thermal contact therewith, said inner housing containing a stacked array of stainless steel heat conductive turnings within said hollow to provide a spongelike mesh array and first and second fuel injectors coupled to the top wall of said inner chamber for introducing liquid fuel within the hollow of said inner chamber and output means formed by and adjoining said bottom wall of said inner chamber for directing vaporized fuel to the carburetor of said engine due to the force of gravity as the liquid fuel flows from the top of said inner chamber into said turnings and out to vaporize and flow to said carburetor via said output means.

4,476,841

VAPOR INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Charles E. Duckworth, 7601 Biscayne Blvd., Miami, Fla. 33138

Filed May 31, 1983, Ser. No. 499,459
Int. Cl.³ F02M 31/00
U.S. Cl. 123—557 5 Claims

1. A fuel injection system for a spark ignition multicylinder internal combustion engine having an intake manifold having

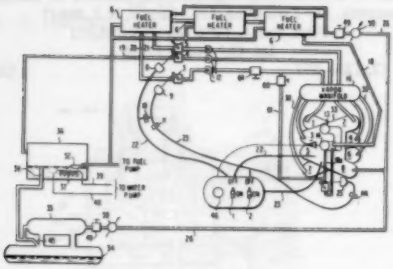
mounted thereon a throttle body venturi including a low speed metering system and a liquid fuel float bowl supplied with liquid fuel, said throttle body venturi supplying air to the intake valves of each cylinder via said intake manifold, said fuel injection system comprising:

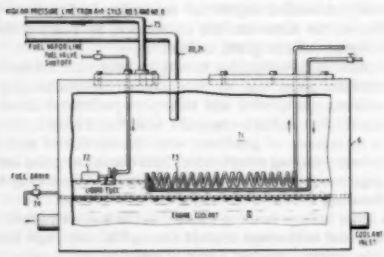
liquid fuel heating means for generating a supply of fuel vapors;

pressurizing means driven by said internal combustion engine and connected to said fuel heating means for pressurizing said supply of fuel vapors;

nozzle means in said intake manifold adjacent each of said intake valves for supplying fuel vapors to each cylinder of said multicylinder internal combustion engine;

first valve actuator means responsive to throttle body venturi pressure and connected between said pressurized supply of fuel vapors and said nozzle means for controlling the flow of fuel vapors to said nozzle means;





second valve actuator means responsive to intake manifold pressure and connected between said pressurized supply of fuel vapors and said nozzle means and also connected between said low speed metering system and said liquid fuel float bowl for controlling the flow of fuel vapors to said nozzle means and controlling the flow of liquid fuel through the low speed metering system; and

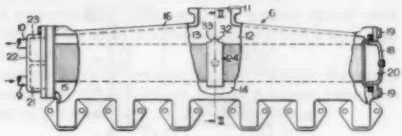
control means connected to each of said first and second valve actuator means for selectively rendering said first and second valve actuator means operative or inoperative, whereby said first and second valve actuator means respectively control the high and low speed injection of fuel vapors and when said second valve actuator means is rendered inoperative by said control means, liquid fuel is supplied by said low speed metering system thereby facilitating starting and warm up of said internal combustion engine until sufficient fuel vapors are generated by said liquid fuel heating means to permit smooth running of said engine.

4,476,842

INTERCOOLER DAMPER SUPPORT

James F. Belsanti, Blue Island, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 20, 1982, Ser. No. 419,930
Int. Cl.³ F02B 29/04; F28F 7/00
U.S. Cl. 123—563 10 Claims



1. An internal combustion engine comprising, an air intake system including, means defining an inlet passage and a plenum chamber for receiving air from a supercharger, an air intake chamber and passages for supplying air to the engine cylinders, means defining an intercooler core chamber for cooling air flowing from said plenum chamber to said air intake chamber including chamber walls intermediate the plenum chamber and said intake chamber, an intercooler core having a plurality of cooling fluid conduits extending the length of said core mounted in said core chamber, support means on the ends of said intercooler core carrying the end of said core, a plurality of cooling fins interleaved between the end supports on said cooling fluid conduits, a perforated intermediate support plate on the center portion of said intercooler core having mating side surfaces adjacent said core chamber walls, an air deflector on said support plate aligned with said inlet passage for distributing air over said intercooler core, damping means on said core chamber walls engaging said support plate providing an intermediate support for damping vibrations.

4,476,843

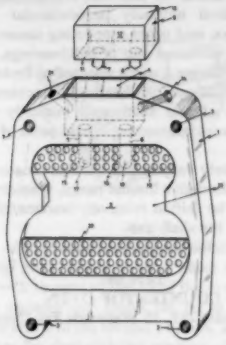
APPARATUS FOR INCREASING THE EFFICIENCY OF CARBURETORS FOR INTERNAL COMBUSTION ENGINES

Sergio Pena-Medina, Calle de Pachuca Manz. 32 Lote 10, Col. San Jerónimo Lídice, 10400, Mexico City, Mexico

Filed Mar. 17, 1983, Ser. No. 476,066
Claims priority, application Mexico, Dec. 10, 1982, 195571
Int. Cl.³ F02M 23/06
U.S. Cl. 123—585 11 Claims

1. An apparatus for increasing the efficiency of carburetors for internal combustion engines, suitable for installation between the carburetor and the admission manifold of an internal combustion engine, comprising a base having a substantially uniform thickness; an opening in said base for alignment with the throats of the carburetor and the admission manifold, in order to permit the passage of the air-fuel mixture through said opening along a predetermined axis towards the admission manifold; a cavity formed in said base; said cavity having an opening adapted to receive air from the atmosphere; a pair of passages bored through said base to communicate said cavity with the opening of the base; a corresponding pair of tubular nozzles connected to said passages and extending into said opening, said tubular nozzles ending in respective openings which are radially offset with respect to the axis of the nozzle; a first perforate plate arranged flush with the upper surface of said base and covering the total length of said nozzles and the openings thereof, said perforate plate extending to a point intermediate the span of said opening of the base; and a second perforate plate arranged flush with the lower surface of the base and in a diametrally opposite position to said first perforate plate, said second perforate plate extending to a point intermediate the span of said opening, such that between the free edges of each one of said perforate plates, seen in vertical

projection, a gap will be left to permit the unobstructed passage of the thus formed mixture of secondary air and air-fuel mixture towards the interior of the admission manifold, with



which a perfectly homogeneous mixture of the original air-fuel mixture with the secondary air is generated, witout appreciable pressure losses by friction.

4,476,844

METHOD OF AND APPARATUS FOR IGNITING INTERNAL COMBUSTION ENGINE

Yukio Kajino, No. 3279-6, Oaza, Yokoze, Yokoze-Mura, Chichibu-Gun, Saitama-ken, 368, Japan

Filed Sep. 17, 1982, Ser. No. 419,305
Int. Cl.³ F02P 1/00, 5/04
U.S. Cl. 123—637 **6 Claims**

1. An apparatus for igniting an internal combustion engine having a source of electric power, comprising:

a pulse generator connected to said power source for generating a train of pulses at such a desired pulse rate as capable of producing a desired number of electric discharges per one explosion step in each of engine cylinders at the maximum number of rotations of an engine crank shaft,

a pulse transformer for stepping-up the voltage of said pulses so as to enable electric discharges of said pulses in a distributor and in ignition plugs,

a distributor having an insulation tube securely disposed radially to a rotor means interlocked with the rotation of the engine, a feed arm disposed in said insulation tube with the discharging top end of the arm being situated inside the radial outermost end of said insulation tube and the base end of the arm being connected to the secondary windings of said pulse transformer and a plurality of stationary electrodes equal in number corresponding to that of the cylinders of the engine and arranged circumferentially at equally spaced intervals separated from each other by an insulating section along an outer circle concentric with a circle traced by the rotation of the outermost end of said insulation tube, and

ignition plugs each disposed in each of said cylinders and connected to a different one of the stationary electrodes of said distributor, and

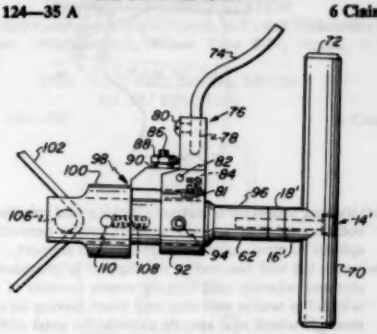
wherein electric discharges of pulses are produced from the ignition plug in each of said cylinders by the number corresponding to the pulse rate of said pulses generated from said pulse generator at the optimum explosion timing when the evaporated fuels in each of the cylinders are compressed to the highest pressure.

4,476,845

ARCHERY BOWSTRING RELEASING DEVICE

Lawrence C. Rickard, 116 W. Pine Tree Ave., Lake Worth, Fla. 33463

Filed Sep. 30, 1982, Ser. No. 428,834
Int. Cl.³ F41B 5/00
U.S. Cl. 124—35 A **6 Claims**



1. A device adapted to draw back a bowstring on a bow away from a target and toward an archer using said bow to a predetermined position holding said bowstring and releasing said bowstring by finger actuation of the device, comprising:

a rigid shaft having a bifurcated end;

grasping means for manually holding the shaft rotatably connected at one end opposite the bifurcated end of said shaft;

a pair of spherically-shaped bowstring impinging members, each member being located in said bifurcated shaft, the size and shape of said bifurcated shaft selected so that one of said pair of spherically-shaped bowstring impinging members will locate at one horizontal side of said bifurcated shaft and the other of said pair of spherically-shaped bowstring impinging members will locate at the other horizontal side of said bifurcated shaft;

impinging member retaining means movably connected to said shaft, said impinging member retaining means having a first position for forcing said impinging members firmly into contact with each other to restrain a bowstring on the side of said impinging members nearest the archer within said bifurcated end of said shaft and which is movable to a second position allowing said impinging members to separate a sufficient distance to allow a bowstring to pass between said impinging members; and

a finger-actuated means operatively connected to said impinging member retaining means said finger-actuated means being pivoted to disengage said impinging means, member retaining as to permit said retaining means to move independently from said first position to said second position.

4,476,846

ADJUSTABLE ARROW SUPPORT

Kenneth D. Carville, 19 Canna Dr., Shrewsbury, Mass. 01545

Filed Jul. 27, 1981, Ser. No. 287,370
Int. Cl.³ F41B 5/00
U.S. Cl. 124—41 A **4 Claims**

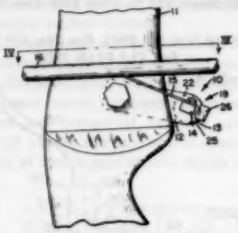
1. Arrow adjusting apparatus for use with bow, comprising:

(a) a main support,

(b) mounting means for attaching the main support to the bow so that one end of said support extends rearwardly of the bow,

(c) a threaded spindle which extends transversely through said one end of the support for rotational and axial movement relative to said one end, said spindle having an arrow rest at one end,

(d) a nut threaded on the spindle so that rotation of the nut causes said spindle to move axially relative to the support, and



(e) locking means for selectively locking said spindle against rotation relative to said support while permitting the spindle to move axially relative to said support,

wherein the said one end of the support is provided with a slot and wherein said locking means consists of a block which lies within said slot, said block having an aperture through which said spindle extends for axial sliding, but non-rotative, movement relative to said block and clamping means for clamping the block to the support.

4,476,847

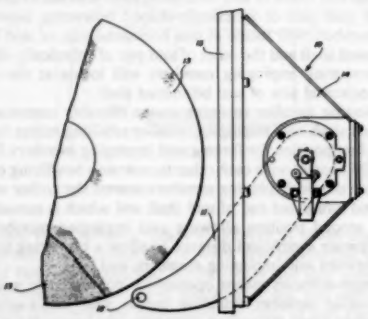
ADJUSTABLE DOUBLE DISC GRINDER DRESSER

Elman R. Dunn, Roscoe, Ill., assignor to Litton Industrial Products, Inc., South Beloit, Ill.

Continuation-in-part of Ser. No. 322,987, Nov. 19, 1981, Pat. No. 4,462,187. This application Sep. 2, 1982, Ser. No. 414,455

Int. Cl.³ B24B *53/00*

U.S. Cl. 125—11 DF **2 Claims**



1. An adjustable double disc grinder dresser comprising:

a dresser arm mounted on a shaft,

a bracket including spaced opposing walls, one of said walls including

means for supporting one end of said shaft for pivotal displacement about its axis and for limited pivotal displacement about mutually perpendicular vertical and horizontal axes, said one supporting means including

a face to face mounted pair of ball bearings, and

spacer means having a width selected to locate the bearing load centers of said ball bearings coincident on the axis of rotation of said shaft, said mutually vertical and horizontal axes intersecting at said point of coincidence, and

means for infinitely varying the horizontal location of the axis of said shaft through a limited range, and

means for supporting the other end of said shaft for pivotal displacement about its axis and for limited pivotal displacement about mutually perpendicular vertical and horizontal axes, said other supporting means including

a face to face mounted pair of ball bearings, and

spacer means having a width selected to locate the bearing load centers of said ball bearings coincident on the axis of rotation of said shaft, said mutually vertical and horizontal axes intersecting at said point of coincidence, and

means for infinitely varying the vertical location of the axis of said shaft through a limited range, whereby the ends of the shaft can be shifted relatively horizontally and vertically to align the shaft axis.

4,476,848

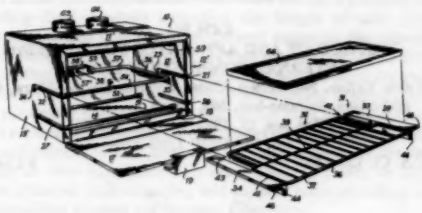
COUNTERTOP OVEN

Roger I. Protas, Suite 28F, 10 Waterside Plz., New York, N.Y. 10010

Filed Oct. 18, 1982, Ser. No. 435,143

Int. Cl.³ A21B *1/00*

U.S. Cl. 126—19 M **20 Claims**



1. An oven comprising:

a steel oven housing including a top wall and an opposed bottom wall, two opposed side walls between the top and bottom walls and a rear wall joined to the top, bottom and side walls for defining an oven cavity;

a door openably mounted to the front of said housing for providing access to the oven cavity;

each of the opposed side walls formed with at least one cooperating slot from the front of the oven housing extending towards the rear of the oven;

heating means for providing heat to the oven cavity; and

a heating and serving tray formed with heat-resistant handles, said tray adapted to slide into the cooperating slots in the oven side walls with the handles remaining on the exterior of the oven housing to facilitate removal of the heated tray and food thereon after heating and wherein the heating and serving tray is a substantially rectangular grill and formed with a metal rod about the perimeter, the metal rod mounted to the heat-resistant handles in the front region and the rear sides of the rod spaced apart from the heat-resistant handles whereby when said tray is inserted into the slots, the side wall is positioned between the rod in the rear section of the tray and the heat-resistant handle.

4,476,849

OUTDOOR GRILL BREATHER

Anthony J. Schmidt, 2779 Fairlane Ave., Waterloo, Iowa 50702

Filed Jun. 1, 1983, Ser. No. 500,169

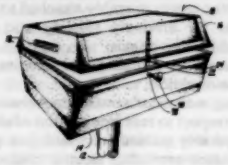
Int. Cl.³ F24B *3/00*

U.S. Cl. 126—25 R **6 Claims**

1. A grill breather device for use on an outdoor grill for cooking food having a lower bin for housing charcoal bri-

quettes or gas pipes and a hinged lid to cover the bin, comprising:

an arm pivotally connected to said grill and moveable between a first horizontal position and a second substantially vertical position,



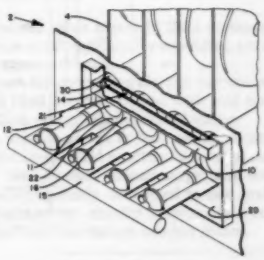
a plurality of legs attached perpendicularly to the arm, the arm being pivoted in a vertical plane inwardly and outwardly with respect to the lid of the grill such that one of the legs engages and props the lid at a selected height when the arm is in the second position, and a knob secured to the arm for changing the position of the arm.

4,476,850

NOISE REDUCING HEAT EXCHANGER ASSEMBLY FOR A COMBUSTION SYSTEM

Mark A. Pickering, Lebanon, Ind., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 2, 1982, Ser. No. 414,143
Int. Cl.³ F23D *13/20*
U.S. Cl. 126—112 3 Claims



1. A noise reducing heat exchanger assembly for a combustion system comprising:

a plurality of side-by-side heat exchangers, each heat exchanger having a bottom part with an inshot burner inlet wherein combustion may occur and a top part for conducting products of combustion away from the bottom part of the heat exchanger, said inshot burner inlets located relative to each other to provide a series of side-by-side inshot burner inlets;

an inshot burner spaced from and facing each inshot burner inlet opening to project a combustion flame into each inshot burner inlet;

an auxiliary port located adjacent to each inshot burner inlet in the bottom part of each heat exchanger and located relative to each other to form a series of side-by-side auxiliary ports;

a chamber interconnecting only the auxiliary ports to allow acoustical coupling between the heat exchangers, said chamber closed off from ambient to substantially prevent the escape of products of combustion from the chamber and to substantially prevent the influx of surrounding air through the chamber into the heat exchangers; and

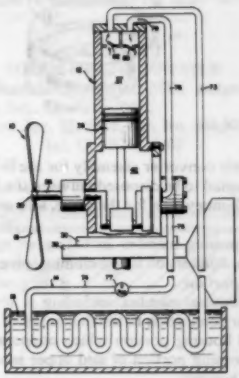
inducer means for drawing products of combustion through each of the heat exchangers from the bottom part to the top part of each heat exchanger.

4,476,851

WINDMILL ENERGY SYSTEM

Hans Brugger, deceased, late of Nyack, N.Y., and Wilhelmina B. Brugger, Administratrix, Grand View 9-W, Nyack, N.Y. 10960

Filed Jan. 7, 1982, Ser. No. 337,526
Int. Cl.³ F24C *9/00*
U.S. Cl. 126—247 1 Claim

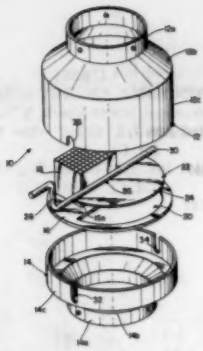


1. A windmill energy system comprising a windmill, including windmill blades rotatably connected to a drive shaft, in combination with a compressor pump in an essentially closed loop system; said compressor including a tubular upper section having a piston chamber in which a piston is slidably disposed, a lower section forming a control chamber separated from said piston chamber by said piston; a crankshaft assembly disposed in said control chamber for reciprocating said piston in response to rotation of said windmill blades, a first and second passageway each extending through said lower section in communication with said control chamber, conduit means for interconnecting said first and second passageway with said piston chamber through a heat exchange means for forming said closed loop, and means rotatably connected to said crankshaft assembly for opening said first passageway and closing said second passageway during the piston discharged stroke and for opening said second passageway and closing said first passageway during the piston suction stroke and further comprising inlet valve means connected to said piston chamber and exhaust valve means connected to said piston chamber with said conduit means having a first conduit connected to said piston chamber through said inlet valve means and to said first passageway and a second conduit connected to said piston chamber through said exhaust valve means and to said second passageway through said heat exchange means and a pressure regulating valve coupling said second conduit to said second passageway and wherein said means for opening and closing said passageways during consecutive strokes of said piston comprises a disk in abutting relationship against said side wall through which said passageways extend, said disk circumscribing an arc of greater than 180°.

4,476,852
ADD-ON CATALYTIC DAMPER ASSEMBLY

Jonathan P. Lee, and Clyde L. Logue, both of P.O. Box 188, Flint Hill, Va. 22627

Filed Dec. 6, 1982, Ser. No. 447,271
Int. Cl.³ F23V 15/00; F23L 11/00
U.S. Cl. 126—289 7 Claims



1. A catalytic converter assembly for use in a wood burning stove and adapted to be disposed between the flue outlet of the stove and a chimney pipe for the stove, said assembly comprising:

an upper housing member including an upper connecting sleeve for connection to the chimney pipe and an enlarged housing portion;

a lower housing member including a lower connecting sleeve for connection to the flue outlet of the stove and an enlarged housing portion which cooperates with the enlarged housing portion of said upper housing member to define a housing;

a mounting plate mounted within said housing and seated in said lower housing member on a support surface defined by said lower housing member, said mounting plate including a pair of openings formed therein in side by side relation;

a catalytic converter mounted in registration with one of said openings so that flue gases passing through that opening pass through the catalytic converter; and

a damper member, comprising a damper plate and an integral control handle, mounted within said housing and rotatable between a first position wherein said damper plate blocks the other opening in said support plate and a second position wherein said opening is unblocked, the upper edge of said lower housing member including a pair of diametrically opposed recesses therein and the outboard ends of said control handle of said damper member being seated in the recesses in said lower housing member such that the control handle is captured between the upper and lower housing members and supported for rotation therebetween.

4,476,853
SOLAR ENERGY RECOVERY SYSTEM

Clayton C. Arbogast, 1503 Desmet, Sheridan, Wyo. 82801

Filed Sep. 28, 1982, Ser. No. 424,868
Int. Cl.³ F24S 3/02
U.S. Cl. 126—425 1 Claim

1. A solar tracking system comprising:

a. solar collector means for receiving radiant energy from the sun said solar collector means comprising a face portion said solar collector means receiving maximum energy input when said face portion is directed directly toward the sun;

b. base means for mounting said solar collector means and other tracking system components;

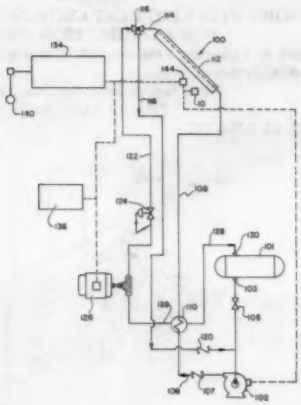
c. first pivotal mounting means for mounting said solar collector means whereby said solar collector means may be pivotal about a first pivot axis between an easterly and a westerly orientation to follow the path of the sun;

d. servo-motor means operably attached to said solar collector means for drivingly rotating said collector means about said first pivot axis;

e. control means for actuating said servo-motor in a forward or reverse direction;

f. sun sensing means for sensing the relative position of the sun with respect to said face portion of said solar collector means operably mounted on said face portion, said sun sensing means providing electric control signals to said control means in response to the movement of the sun whereby said face portion of said collector means is periodically redirected toward the sun;

g. light intensity sensing means operably mounted on said face portion for providing control signals to said control means at a preselected level of sunlight intensity whereby said control means actuated said servo-motor to rotate said solar collector means for an easterly to a westerly orientation at a predetermined rate independent of the position of the sun when the intensity of the sunlight is



below said preselected level, and wherein said control means actuates said servo-motor in response to signals from said sun sensing means when the intensity of sunlight is above said preselected level;

h. sunset switching means for overriding said sun sensing means and said light intensity sensing means for providing a control signal to said control means when said solar collector means has rotated to a position corresponding to the sunset position of the sun whereby said control means actuates said servo-motor to return said solar collector to a position corresponding to the sunrise position of the sun; whereby said solar collector is positioned at a predetermined sunrise position at the beginning of each solar day, follows the sun from sunrise to sunset during bright sunlight or cloud cover conditions and returns to the predetermined sunrise position at sunset;

wherein said sun sensing means comprises a first phototransistor means for generating an electric signal and a shroud means for enclosing said first phototransistor means;

wherein said shroud means comprises a regular parallel piped having a first face fixedly positioned on the face of said solar collector means and a second transparent face positioned in a westerly facing direction wherein direct sunlight strikes said first phototransistor means only by passing through said transparent westerly oriented face;

wherein said light intensity sensing means comprises a second

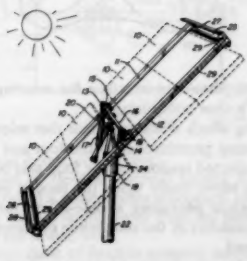
phototransistor means for generating an electric signal, the intensity of which is dependent on the intensity of sunlight;
wherein said second phototransistor means comprises an enclosing means having a convex transparent face for receiving sunlight from a direction generally perpendicular to said face portion of said solar collector and from angles substantially divergent therefrom;
wherein said solar collector means comprises a parabolic trough solar collector;
wherein said parabolic trough solar collector is operably connected to a solar energy generating unit comprising:
heat medium for energy transfer;
a heat medium surge tank for holding said heat medium;
circulation conduit means in communication with said surge tank for circulating said heat medium;
circulation pump means operably communicating with said circulated conduit means for circulating said heat medium therethrough;
preheating means operably positioned about said circulation conduit means for preheating the heat medium therein downstream said circulation pump means;
said parabolic trough collector attached in fluid communication with said circulation conduit means downstream said preheating means for further heating said heat medium;
two way temperature control valve means having a first and second outlet for selectively directing said heat medium through a recirculation conduit means or a turbine conduit means in response to heat medium temperature in communication with said parabolic trough collector;
recirculation conduit means in fluid communication with said a first outlet of said two-way temperatures control valve means and said circulation pump means;
turbine conduit means in fluid communication with said second outlet of said two-way temperature control valve means;
pressure control valve means in fluid communication with said turbine conduit means for providing a constant downstream pressure therein;
turbine means for generating electric current operably positioned in fluid communication with said turbine conduit downstream said pressure control valve;
return line conduit means in fluid communication with said turbine means and said heat medium surge tank for returning said heat medium to said surge tank said return line means being operably connected to said preheater means for providing heat transfer between said return conduit means and said circulation conduit means.

4,476,854

GAS SPRING SOLAR TRACKER

Stephen C. Baer, Albuquerque, N. Mex., assignor to Zomeworks Corporation, Albuquerque, N. Mex.

Filed Nov. 14, 1983, Ser. No. 551,240
Int. Cl.³ F24J 3/02; F03C 5/00
U.S. Cl. 126—425 **21 Claims**



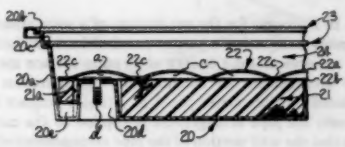
1. Apparatus for tracking the sun comprising:
a pivotable frame;
large and small cannisters located at the respective ends of the frame, the large cannister having a volume V_L larger than the volume V_S of the small cannister;
means for shading the cannister nearer to the sun more than the cannister farther from the sun when the rays of the sun are not normal to the plane of the cannisters;
a conduit providing fluid communication between the cannisters and having a volume V_C;
a quantity of volatile fluid in the cannisters and conduit having a liquid volume V_F defined by the limits $V_S+V_C<V_F<V_L$, so that sufficient solar heating of the small cannister relative to the large cannister forces all of the liquid volatile fluid from the small cannister to purge it of any foreign gasses; and
a gas spring fluid in the large cannister having a vapor pressure sufficient to force the volatile fluid into the small cannister in the absence of sunlight so that the frame tilts toward the small cannister at nightfall and at other times when sunlight does not strike the small cannister.

4,476,855

SOLAR HEATING DEVICE

Sherwood G. Benfield, Matthews, N.C., assignor to Unified Technologies, Inc., Charlotte, N.C.

Filed Apr. 15, 1982, Ser. No. 368,902
Int. Cl.³ F24J 3/02
U.S. Cl. 126—426 **23 Claims**



1. A solar heating device comprising an open top thin-walled receptacle, thermal insulating means formed of a sheet of expanded foam positioned in the bottom of said receptacle, said foam sheet being relatively rigid and adhesively secured to the bottom of said thin-walled receptacle to lend rigidity and strength thereto, a flexible-walled container for a fluid overlying and resting on said thermal insulation means, the walls of said container comprising opposing fusibly bonded together sheets of fabric reinforced fluoroplastic material impermeable to vapor, said flexible-walled container having an inlet and an outlet for a fluid to be heated to flow into and out of said container, said container also having means defining fluid flow passages communicatively connecting said inlet and outlet for the flow therethrough of the fluid to be solar heated, and transparent cover means on said receptacle and serving as a top enclosure cover therefor, said transparent cover means overlying said flexible-walled container and being in spaced relation thereto and serving to define a solar heating chamber overlying said flexible-walled container.

3. A solar heating device comprising an open top receptacle, thermal insulating means positioned in the bottom of said receptacle, a flexible-walled container for a fluid overlying and resting on said thermal insulating means, the walls of said container comprising opposing interconnected sheets of reinforced fluoroplastic material impermeable to vapor and substantially unaffected by outdoor weathering, said sheets being fusibly bonded together to define a fluid flow passageway through the container and with an inlet and an outlet for a fluid to be heated to flow into and out of said container, said sheets having a reinforcing fabric intimately bonded to each sheet to lend strength and dimensional stability thereto, and transparent cover means on said receptacle and serving as a top enclosure cover therefor, said transparent cover means overlying said flexible-walled container and being in spaced relation thereto

and serving to define a solar heating chamber overlying said flexible-walled container.

4,476,856

PROCESS FOR THE PRODUCTION OF A SOLAR COLLECTOR PANEL ASSEMBLY AND A PANEL ASSEMBLY PRODUCED THEREBY

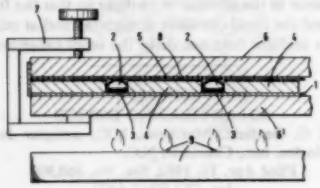
Jaroslav Cacarda, Strullendorf, Fed. Rep. of Germany, assignor to E. Cacarda GmbH, Strullendorf, Fed. Rep. of Germany

Filed Dec. 29, 1983, Ser. No. 566,568

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301858

Int. Cl.³ F24J 3/02

U.S. Cl. 126—447 **18 Claims**



1. In a process for the production of a solar collector panel assembly comprising a carrier panel of heat-conductive material, to serve as solar energy absorption surface means, and a pipe arrangement of meander-like configuration which is mounted on the carrier panel in intimate contact therewith, wherein the pipe arrangement is applied to the carrier panel such that the wall portion of the pipe arrangement which in the assembled condition of the panel assembly is towards the carrier panel is brought into contact with a joining agent on the carrier panel, a filling material is introduced into the spaces defined on the carrier panel by the pipe arrangement, the intermediate assembly formed by the carrier panel, the pipe arrangement, the joining agent, and the filling material is disposed between first and second pressure plates with flat surfaces to cover the intermediate assembly, the pressure plates are urged towards each other, and heat is applied at least to the pressure plate which bears against the carrier panel, to cause the joining agent to melt thereby to form the join between the pipe arrangemment and the carrier panel, the improvement that said filling material is introduced in a thickness which is so much smaller than the height of the highest point of the cross-section of the pipe arrangement on the carrier panel above the base surface thereof that, after the joining agent has melted, said filling material bears on one side against the carrier panel and on the other side against the adjacent surface of said adjacent pressure plate.

4,476,857

ARM SUPPORT

Norman D. Levine, 2205 NW. 30th Pl., Pompano Beach, Fla. 33060

Filed Jan. 14, 1983, Ser. No. 458,035

Int. Cl.³ A61F 13/00

U.S. Cl. 128—77 **5 Claims**

1. An arm support for prevention and treatment of epicondylitis (tennis elbow) by providing muscle compression, stabilization, and heat retention for the forearm, said arm support comprising:

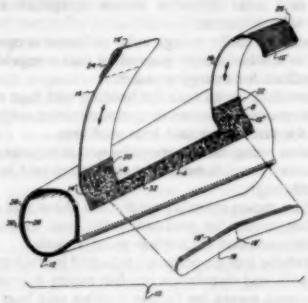
an elongated elastic sleeve having a center layer of neoprene rubber and inner and outer layers of flexible fabric;

said inner and outer layers each bonded to a different side by said neoprene rubber layer;

said sleeve shaped and sized to provide overall compression for the user's forearm muscles between just above the user's wrist to just below the user's elbow;

said neoprene rubber layer for retaining body heat beneath and within said neoprene rubber layer;

at least one elongated elastic pliable bands attached to said outer layer of said sleeve;



said bands including interengaging surfaces such that said bands may be stretched and secured about the user's forearm;

said bands for providing additional adjustable localized muscle compression.

4,476,858

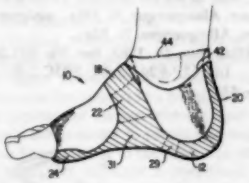
SHOE-FOOT INTERFACE

R. Stephen Curtis, 2828 Lemmon Ave., Dallas, Tex. 75204

Filed Dec. 27, 1982, Ser. No. 453,469

Int. Cl.³ A61F 13/00

U.S. Cl. 128—80 R **18 Claims**



1. An orthotic shoe-foot interface for wearing on the foot while wearing a shoe comprising:

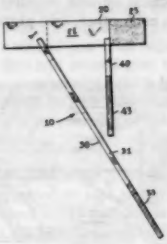
a body having shock absorbing areas that selectively cover both the bony prominences of the foot and the insertion points of selected tendons on the foot, said body allowing the toes to move freely when the shoe is worn over the interface while providing a shoe-filling function to enhance the comfort of the shoe while cushioning the wearer's foot; and

a second thicker shock absorbing area selectively disposed to cover the anatomical area adjacent the calcaneal prominence, the insertion point of the plantar fascia tendon, the heads of the metatarsal bones and the arch of the foot.

4,476,859
FREE ARM SHOULDER SLING

Eleanor A. Kloepfer, and Katharine A. Fox, both of 7795 W. 120th Ave., Broomfield, Colo. 80020

Filed Mar. 31, 1982, Ser. No. 364,057
Int. Cl.³ A61F 5/04
U.S. Cl. 128—87 B 5 Claims



1. A free arm shoulder sling consisting of:

a generally rectangular arm encircling cuff member comprising a wide strip of elasticized material having a first and second cooperating fastening means, disposed adjacent to ends of the cuff member, and on opposite sides.

a neck loop member disposed adjacent the first of the said cooperating fastening means, and secured on one end to the top of the cuff member, and

a shoulder loop member secured on one end to the top of the cuff member and disposed adjacent to the second of the cooperating fastening means; wherein,

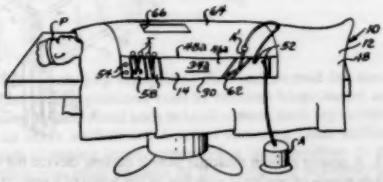
the neck loop member and the shoulder loop member comprise strips of material which are also provided with a first and second cooperating fastening means disposed adjacent their respective ends and on opposite sides, and

the neck loop member comprises an elongated strip of material whose length is approximately twice the length of the shoulder loop member, and the shoulder loop member projects from the cuff member at an angle of 90°, while the neck loop member projects from the cuff member at an angle of other than 90°.

4,476,860
SURGICAL DRAPE

Robert F. Collins, Barrington, Ill., and Amy S. Paul, Wayland, Mass., assignors to The Kendall Company, Boston, Mass.

Filed Sep. 15, 1982, Ser. No. 418,328
Int. Cl.³ A61B 19/06
U.S. Cl. 128—132 D 13 Claims



1. A surgical drape, comprising:

a main sheet of flexible material having an inner surface facing toward a patient after placement of the drape, and an outer surface facing away from the patient after placement of the drape; and

a transparent sheet of flexible material having a pair of opposed end edges, a pair of opposed side edges connecting the end edges, first and second spaced fold lines generally aligned with said side edges and extending between said end edges, said first and second fold lines defining a central panel extending between said first and second fold lines and a pair of outer panels extending from said central panel and being directed toward each other, said outer panels having an outer edge defining an opening facing toward each other to form a pair of opposed pockets, said transparent sheet having first seal lines between said outer panels and central panel, with said first seal lines extending between the first and second fold lines and the outer edges at a location adjacent said end edges.

4,476,861
INSTRUMENT FOR REMOVAL OF A BONE CEMENT TUBE IN AN ARTIFICIAL FEMUR HEAD REIMPLANTATION

Christos Dimakos, Prinzenstr. 11,, 4600 Dortmund 1, and Gerhard Radtke, Neue Sendstr. 2b, 4600 Dortmund 12, both of Fed. Rep. of Germany

Continuation of Ser. No. 204,196, Nov. 5, 1980, abandoned. This application May 5, 1983, Ser. No. 491,972
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1979, 2944710
Int. Cl.³ A61B 17/00
U.S. Cl. 128—303 R 4 Claims

1. An instrument for removing a hollow bone cement tube from a cavity in a bone, said bone cement tube having a generally annular tubular configuration with a radially innermost diameter and a radially outermost diameter, said instrument comprising:

a hollow tube having an open operating end and an open insertion end adapted to be placed within said bone cement tube, said hollow tube having a radially outermost diameter which is smaller than said radially innermost diameter of said bone cement tube to enable passage of said hollow tube within and through said bone cement tube;

male thread means in said hollow tube adapted for engagement with female thread means in said bone cement tube for affixing said hollow tube with said bone cement tube;

a mandrel extending through the interior of said hollow tube from said operating end to beyond said insertion end and freely rotatable relative to said hollow tube;

collet means attached to said mandrel at an end thereof extending beyond said insertion end of said hollow tube, said collet means being adapted to normally extend radially no further than the outside diameter of said hollow tube during insertion of said hollow tube into said bone cement tube;

said collet means being formed with a frustoconical configuration having a larger diameter portion adjacent said insertion end of said hollow tube which in the insertion position of said collet means extends no further than the outer diameter of said hollow tube;

longitudinal slots formed in said collet means for enabling said collet means to be radially spread to have said larger diameter portion extend radially beyond beyond the outer diameter of said hollow tube;

internal thread means in said collet means and external thread means on said mandrel for engagement with said internal thread means;

tapered peripheral surface means formed on said larger

diameter portion of said collet means adapted to engage complementary tapered peripheral surface means formed on said insertion end of said hollow tube to facilitate spreading action of said collet means when said collet means is urged against said insertion end by operation of said mandrel through interengagement of said external thread means and said internal thread means;

said mandrel being operable to urge said collet means against said insertion end of said hollow tube to radially spread said collet means beyond the outer diameter of said hollow tube in order that said collet means may be brought into abutment with the inner end of said hollow bone cement tube to facilitate removal thereof by manipulation of said mandrel after said collet means has been inserted together with said hollow tube through said bone cement tube to be located on an inner end thereof; and

means for applying to the inner end of said bone cement tube through the engagement of said spread collet means with said bone cement tube an outwardly directed force for facilitating removal of said bone cement tube.

4,476,862

METHOD OF SCLERAL MARKING

David S. C. Pao, 95 High Point Dr., Churchville, Pa. 18966

Division of Ser. No. 213,861, Dec. 8, 1980, abandoned, which is a continuation of Ser. No. 9,422, Feb. 5, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 428,849

Int. Cl.³ A61B *17/39*

U.S. Cl. 128—303.17 **1 Claim**

1. A method of scleral marking comprising the steps of:

(a) providing a hand held apparatus comprising an elongate cylindrical axial electrode having a first end, a tubular outer electrode coaxially disposed around and electrically insulated from said axial electrode, and wherein said first end of said axial electrode extends beyond an end of said outer electrode and is tapered to a point, said taper beginning at about the end of said outer electrode;

(b) providing means electrically connected to said hand held apparatus for applying an electrical power source across said axial and outer electrodes; and

(c) activating said electrical power source while touching said tapered point and the end of said outer electrode to the sclera to produce repeatable marks on the sclera.

4,476,863

SURGICAL INSTRUMENT FOR ESTABLISHING CIRCULAR COLOANASTOMOSES

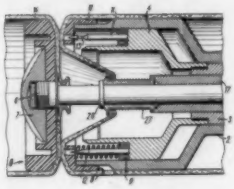
Nikolai N. Kanshin, Malaya Filevskaya ulitsa, 68, kv. 10; Igor A. Guskov, ulitsa Metallurgov, 28, kv. 176; Alexei A. Konoplev, shosse Entuziastov, 68, kv. 47; Alexandr E. Sachkov, ulitsa Molostovykh, 15, korpus 2, kv. 97, and Matvei M. Mats, Veshnya-kovskaya ulitsa, 25/2, kv. 412, all of Moscow, U.S.S.R.

Filed Mar. 9, 1981, Ser. No. 253,523

Int. Cl.³ A61B *17/11*

U.S. Cl. 128—305 **5 Claims**

1. A surgical instrument for establishing circular coloanastomoses in a colonic lumen, comprising a cylindrical body having a mandrel at one end, a rod coaxially arranged in said mandrel and having a longitudinal axis, a circular knife attached to said rod, means for moving said rod along its longitudinal axis, a stem having a thrust head axially movable with respect to said rod, means for establishing circular anastomoses comprising two members, one said member located on said mandrel, a plurality of suturing elements attached to said one member adapted to move with the rod during the course of establishing circular anastomoses, the other said member located on the thrust head, wherein a portion of said circular anastomosing means located on said mandrel comprises two rings spaced apart from each other, said plurality of suturing



elements equispaced circumferentially between said rings, said suturing elements comprising needles, shock absorbing means accommodated on at least one of said needles, and wherein the other said member of said circular anastomosing means comprises a third ring coupled to the thrust head and adapted to separate therefrom during the course of anastomosing, both of the members of said circular anastomosing means being joined together through said needles in the course of anastomosing and are adapted to remove in the colonic lumen until complete necrosis of a compressed colon portion occurs.

4,476,864

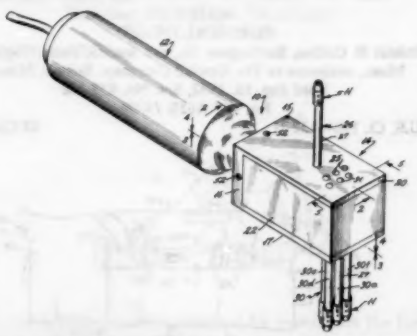
COMBINED MULTIPLE PUNCH AND SINGLE PUNCH HAIR TRANSPLANT CUTTING DEVICE

Jirayr Tezel, 221 Falmouth Rd., Scarsdale, N.Y. 10583

Filed Sep. 29, 1982, Ser. No. 428,139

Int. Cl.³ A61B *17/32*

U.S. Cl. 128—305.1 **5 Claims**



1. A power driven multiple punch cutting device for making either single or multiple punches in the scalp of a patient undergoing a hair transplant operation, comprising

a housing having a plurality of apertures in a first wall thereof and a single aperture in a second wall thereof opposite to said first wall;

a plurality of shaft members extending through said housing from said second wall to said first wall and perpendicularly outward from said first wall through said plurality of apertures;

a single shaft member extending through said housing from

said first wall to said second wall and perpendicularly outward from said second wall through said single aperture;

first means for rotatingly driving said single shaft member comprising a first bevel gear connected to said power source and a second bevel gear connected to said single shaft member and driven by said first bevel gear;

second means for rotatingly driving each of said plurality of shaft members comprising a first gear train adjacent said first wall and a second gear train adjacent said second wall wherein said first and second gear trains comprise a plurality of spur gears, one of which spur gears in said first gear train is driven by an idler gear and causes rotation of the remainder of the plurality of spur gears which in turn rotatingly drive said plurality of shaft members;

means for transmitting the driving power from said first drive means to said second drive means comprising a first spur gear connected to said single shaft member spaced from said second bevel member and adjacent said first wall, and said idler gear adjacent said first wall and driven by said first spur gear;

a power source for driving said first drive means, whereby driving of said first drive means by said power source causes rotation of said single shaft member and simultaneous rotation of said plurality of shaft members through said power transmitting means and said second drive means, respectively; and

cutting heads attached to the free ends of each of said single shaft member and said plurality of shaft members;

whereby said device is capable of making either simultaneous multiple punches through the cutting heads attached to the plurality of rotating shaft members or a single punch through the cutting head attached to the single rotating shaft member.

4,476,865

NON-METALLIC, BIO-COMPATIBLE HEMOSTATIC CLIPS

Stephen J. Failla, Chester; Stephen J. Jewusiak, Denville, and William J. Zwaskis, Carteret, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Feb. 12, 1982, Ser. No. 348,399
Int. Cl.³ A61M *17/12*
U.S. Cl. 128—326 **4 Claims**

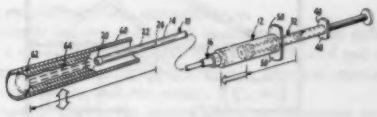
1. A hemostatic clip comprising first and second leg members joined at their proximal ends by resilient hinge means and terminating at their distal ends in latch means, each leg member having an outer surface and a vessel clamping inner surface, said vessel clamping inner surace being in opposition to the vessel clamping inner surface of the other leg member, the outer surface of each leg member being configured to be accepted by the jaws of a clip applier wherby the clip may be clamped about a vessel, said first leg member terminating at the distal end thereof in a portion of the latch means, said portion comprising a deflectable hook member extending from the inner face of said leg member, said hook member having an inner surface spaced from the inner surface of said leg member, said second leg member terminating at the distal end thereof in a complementary locking portion of the latch means whereby when said first and second leg members are pivoted about said hinge means, the distal end of said leg member deflects and engages the hook member of the first leg member to lock the clip in a closed position, the vessel clamping surface of said first leg member having a concave radius of curvature between the hinge means and the hook member and the vessel clamping surface of the second leg member having a convex radius of curvature between the hinge means and its distal end, the radius of curvature of the vessel clamping surface of said second leg member being smaller than the radius of curvature of the vessel clamping surface of said first leg member whereby hook member is urged towards the hinge means when pressure is placed on the vessel clamping surfaces of the leg members when the clip is in the closed position to aid in securing the clip in the closed position.

4,476,866

COMBINED LARGE AND SMALL BORE SYRINGE

Albert K. Chin, San Francisco, Calif., assignor to Thomas J. Fogarty, Palo Alto, Calif.

Filed Aug. 6, 1982, Ser. No. 406,030
Int. Cl.³ A61M *29/02*
U.S. Cl. 128—344 **8 Claims**



1. In combination, a dilatation catheter comprising a catheter portion and a syringe portion having its distal outlet end attached to the proximal inlet end of the catheter portion, said catheter portion comprising an elongated flexible tube having an invertible-eversible balloon element attached to and received within the distal end thereof, said syringe portion comprising a large bore cylinder and a large bore piston fitted therein and a small bore cylinder and a small bore piston fitted therein, said large bore cylinder having a distal outlet end in communication with said flexible tube, said large bore piston having said small bore cylinder formed therein, said small bore cylinder having a distal outlet end in communication with said large bore cylinder, the cross-sectional area of the bore of said large bore cylinder being a plurality of times as great as the cross-sectional area of the bore of said small bore cylinder whereby compression of said small bore piston within said small bore cylinder functions to evert the balloon element under high pressure and compression of said large bore piston within said large bore cylinder functions to inflate the balloon element under a lower pressure for dilatation.

4,476,867

APPARATUS FOR EFFECTING HYPERTHERMIC TREATMENT

Leon C. Parks, Baltimore, Md., assignor to Research Against Cancer, Inc., Jackson, Miss.

Division of Ser. No. 802,033, May 31, 1977, Pat. No. 4,181,132.
This application Aug. 23, 1979, Ser. No. 68,950
Int. Cl.³ A61F *7/00*
U.S. Cl. 128—400 **1 Claim**

1. Apparatus for providing a constant flow of temperature controlled liquid into and out of heat exchanger means in heat exchange relation to a flow of blood through said heat exchanger means which forms a part of a systemic extracorporeal flow circuit of a human patient for systemically treating the patient hyperthermically to retard the growth of cancer cells in the patient, said apparatus comprising

first reservoir means for containing a first body of liquid,

second reservoir means for containing a second body of liquid,

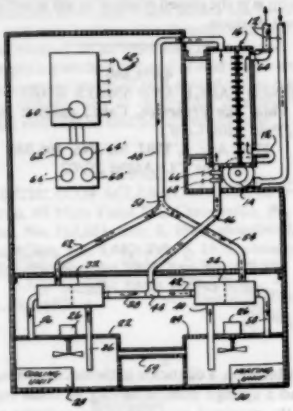
first pump means for pumping liquid from said first reservoir means,

second pump means for pumping liquid from said second reservoir means,

means for directing a predetermined constant flow of liquid from said pump means into said heat exchanger means,

means for maintaining the liquid in said first reservoir means at a substantially constant elevated temperature of approximately 45° C.,

means for maintaining the liquid in said second reservoir means at a substantially constant reduced temperature of approximately 30° C.,



means for varying the amount of liquid from said first pump means directed into said liquid flow directing means from 0 to 100% while proportionately varying the amount of liquid from said second pump means directed into said liquid flow directing means from 100% to 0% and while maintaining the constant flow as aforesaid, and

means for directing the liquid from said heat exchanger to said first and second reservoir means in amount generally proportional to the amount of liquid from said first and second pump means respectively directed into said liquid flow directing means.

4,476,868

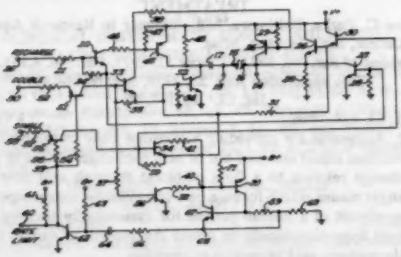
BODY STIMULATOR OUTPUT CIRCUIT

David L. Thompson, Fridley, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 957,826, Nov. 6, 1978,. This application Sep. 8, 1980, Ser. No. 184,777

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **5 Claims**



1. A body implantable stimulator of the type having output means adapted for connection to the body for the delivery of stimulation signals thereto comprising means for storing stimulation energy connected to said output means, means controlling the discharge of said energy storing means, means forming a first charge path for said energy storing means and means forming a second, selectively conductive, charge path for said energy storing means, said second charge path having a lower impedance than said first charge path and including means for selectively rendering said second charge path conductive independently of the charge of said stimulation energy storing means and said energy storing means discharge controlling means.

4,476,869

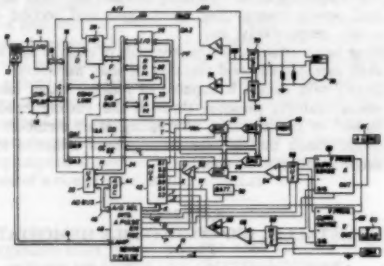
PACER ANALYZER

Daniel Bihn, Aptos, Calif., assignor to Intermedics, Inc., Freeport, Tex.

Continuation of Ser. No. 156,662, Jun. 5, 1980, abandoned. This application Aug. 31, 1982, Ser. No. 413,402

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PT **45 Claims**



1. An analyzer apparatus connected to a heart and an implantable pacer for monitoring the operational parameters of signals generated by the heart and the implantable pacer and for testing the pacing operation of the pacer, said apparatus comprising:

a sensing circuit for sensing the operational parameters of the signals of the heart;

a pacer operating circuit for generating a simulated heart signal to the implantable pacer and for sensing the operational parameters of signals of the implantable pacer;

a heart stimulating circuit for generating stimulation signals to pace said heart;

control means for determining which operational parameters of the heart and pacer signals are monitored and for selecting parameter values for the signals generated by said pacer operating circuit and heart stimulating circuit;

enabling processing means for activating said heart stimulating circuit to pace the heart and monitoring and generating digital representations of the sensed heart and pacer signals and the signals generated by the heart stimulating circuit;

supervising processing means responsive to said control means for controlling the enabling processing means and for receiving said transmitted digital representations;

said supervising processing means responsive to said enabling processing means, for controlling the operation of the heart stimulating circuit by transmitting the parameter values selected by the control means to said enabling processing means; and

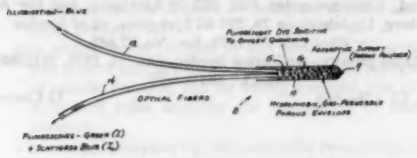
display means, responsive to said supervising processing means, for displaying said digital representations and the parameter values selected by said control means.

4,476,870

FIBER OPTIC P_{O2} PROBE

John I. Peterson, and Raphael V. Fitzgerald, both of Falls Church, Va., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 363,425, Mar. 30, 1982, abandoned. This application Jul. 7, 1982, Ser. No. 396,055
Int. Cl.³ A61B 5/00
U.S. Cl. 128—634 14 Claims



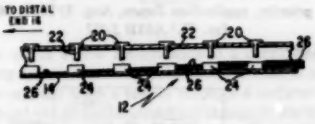
1. A probe for determining P_{O2} in the blood or tissue of a living animal, comprising: an oxygen-porous jacket of a size sufficiently small to be passed into a blood vessel; a porous dye support carried within said jacket, said dye support and said jacket having sufficiently high permeability to permit the exposure of individual dye molecules carried thereby to oxygen collision; a non-toxic luminescent dye carried by said porous dye support, said dye being excitable by visible light, having and sufficiently great stability to aging to permit storage without substantial change of dye characteristics, and being oxygen quenching-sensitive; and fiber optic means to pass excitation light to said dye within said jacket and collect luminescence therefrom.

4,476,871

MONITORING OF CERVICAL DILATATION DURING LABOR

Edward H. Hon, Bradbury, Calif., assignor to American Home Products Corporation, New York, N.Y.

Filed Apr. 23, 1982, Ser. No. 371,371
Int. Cl.³ A61B 5/04, 5/10
U.S. Cl. 128—642 9 Claims



1. A device for use in monitoring cervical dilatation during labor comprising:

an elongated flexible compressible member having a longitudinal axis and being adapted for positioning between a fetal presenting part and a cervix; and

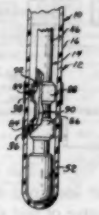
means for measuring the recession of the cervix along the longitudinal axis of the elongated compressible member during cervical dilatation which include pressure detecting means having a plurality of pressure responsive switches spaced axially along the member for detecting a position along the longitudinal axis of the member at which pressure is exerted thereon by the fetal presenting part and the cervix.

4,476,872

ESOPHAGEAL PROBE WITH DISPOSABLE COVER

Alfred R. Perlin, Highland Park, Ill., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 128,323, Mar. 7, 1980, Pat. No. 4,349,031.
This application May 12, 1982, Ser. No. 379,681
The portion of the term of this patent subsequent to Sep. 14, 1999, has been disclaimed.
Int. Cl.³ A61B 5/02
U.S. Cl. 128—642 7 Claims



1. An esophageal probe, comprising:

a disposable housing comprising an elongated sleeve defining a cavity having a proximal end, a distal end and an inner surface, said housing having a proximal opening communicating with the cavity;

a permanent monitoring device having an elongated stem removably receivable through said opening in said sleeve cavity, said stem having a proximal end, a distal end and means for monitoring a body function of a patient from within the sleeve;

a pair of spaced electrodes on an outer surface of the sleeve;

means for releasably attaching said monitoring device to said housing with said stem received in the sleeve cavity; and

means for establishing electrical connection between the electrodes and the probe monitoring device, wherein the electrical establishing means comprises a pair of spaced contacts electrically connected to the electrodes on said inner surface of the sleeve, and a pair of spaced contacts on said stem which contact the sleeve contacts when the monitoring device is attached to the housing.

4,476,873

ULTRASOUND SCANNING SYSTEM FOR SKELETAL IMAGING

Paul D. Sorenson, Blaine; Dale A. Dickson, Fridley; Larry A. McNichols, and John D. Badzinski, both of Coon Rapids, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 3, 1982, Ser. No. 415,042
Int. Cl.³ A61B 10/00
U.S. Cl. 128—660 10 Claims

1. An ultrasound scanning system for skeletal imaging of a back comprising:

an array of ultrasound transducers for generating an ultrasound signal, for receiving an ultrasound signal, and for producing an electrical signal representative of said received ultrasound signal;

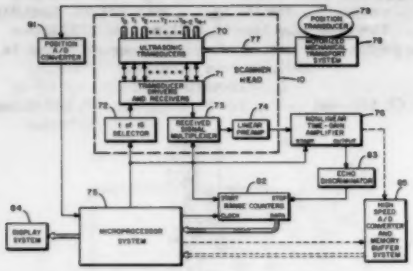
means for providing a range signal representative of the distance from each transducer of objects interacting with said ultrasound signal;

means for producing a position signal representative of each transducer position on the back;

means responsive to said range signals and said position signals for differentiating pleural sac and lung tissue from skeletal structure;

means for producing a profile showing range as a function of position;

means for identifying locations on said profile indicative of said skeletal structure; and



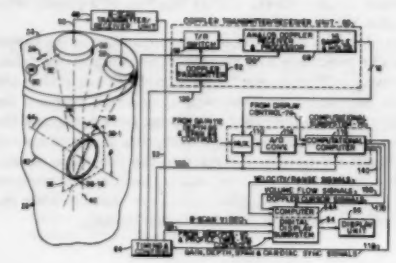
means utilizing said identified locations for providing a display representative of said skeletal structure.

4,476,874

ULTRASONIC IMAGING WITH VOLUME FLOW MEASURING METHOD AND APPARATUS

Jon C. Taenzer, Palo Alto; Donald J. Burch, Los Altos, and Philip S. Green, Atherton, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jun. 1, 1982, Ser. No. 383,568
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—663 **22 Claims**



15. In a real-time ultrasonic imaging system having first and second operating modes under operator control, said system comprising,

a pulsed real-time B-scan imaging system for periodically providing video field signals comprising recurrent video line signals,

pulse echo means including transducer means for recurrently beaming pulses of ultrasonic waves across a vessel through which liquid flows and providing a plurality of Doppler velocity signals proportional to liquid flow through the vessel at a plurality of spaced points along a line extending substantially diametrically across the vessel,

A-scan line acquisition means responsive to signals from said B-scan imaging system for acquiring data for display of an A-scan substantially from along said line extending substantially diametrically across said vessel,

means for generating cursor data for identifying the line along which Doppler velocity signals are obtained,

visual display means of the cathode ray tube type,

means for communicating B-scan video signals from said B-scan imaging system, cursor data from said cursor data generating means, and A-scan data from said A-scan acquisition means to said visual display means in the first operating mode of the system for simultaneous display at said visual display means of a real time B-scan image, a cursor, and an A-scan line, and

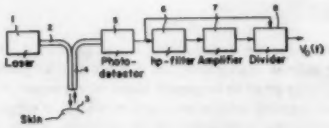
means for communicating Doppler velocity signals from said pulse echo means to said visual display means in the second operating mode of the system.

4,476,875

METHOD AND APPARATUS FOR MEASURING FLOW MOTIONS IN A FLUID

Gert E. Nilsson, Frösaregatan 9, 582 66 Linköping; Jan T. Tenland, Konsistoriegatan 10B, 582 34 Linköping, and Per A. Öberg, Ugglebovägen 79, 590 60 Ljungsbro, all of Sweden

Filed Oct. 23, 1979, Ser. No. 87,685
Claims priority, application Sweden, Oct. 31, 1978, 7811288
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—666 **12 Claims**



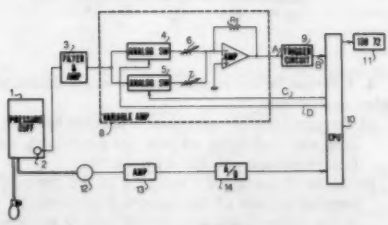
1. A method of determining flow motions in a fluid containing light scattering particles, such as for determining blood circulation in superficial blood vessels in a tissue, the method comprising the steps of illuminating the fluid with monochromatic light; gathering light scattered by the particles in in the fluid and any adjacent substantially stationary structures from two, at least partially separated but mutually adjacent regions of the illuminated section of the fluid; transmitting the light gathered from said two regions separately to two different photodetectors, these two photodetectors receiving light scattered at least partially from different particles; deriving from the respective output signal from each of the photodetectors a respective signal representing the beat frequency components between light components with different frequencies received by the respective photodetector; subtracting the two signals so derived from the output signals of the respective photodetectors from one another; and using the resulting signal from this signal subtraction as a measure of flow motions in the fluid.

4,476,876

ELECTRONIC SPHYGMOMANOMETER

Taizo Uchiyama, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1982, Ser. No. 400,933
Claims priority, application Japan, Aug. 1, 1981, 56-121039
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—682 **6 Claims**



1. An electronic sphygmomanometer which comprises:

an inflatable cuff having transducing means for producing electrical Korotkoff pulses indicative of Korotkoff tapping sounds, said cuff being inflatable over a pressure

range including systolic and diastolic pressures to be measured;

a Korotkoff pulse amplifier which amplifies the Korotkoff pulses from said transducing means;

a trigger circuit coupled to said Korotkoff pulse amplifier, which produces an output pulse upon being triggered by an amplified Korotkoff pulse input thereto from said Korotkoff pulse amplifier;

a pressure detector, connected to said cuff, which produces an output signal indicative of the cuff pressure;

a processor coupled to said trigger circuit and to said pressure detector, which reads in the output signal of said pressure detector in order to recognize systolic and diastolic pressure; and

gain setting means coupled to said processor for setting a first gain of said Korotkoff pulse amplifier for recognition of systolic pressure, and for setting a second gain of said Korotkoff pulse amplifier for recognition of diastolic pressure;

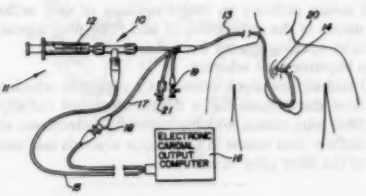
wherein said processor includes means for recognizing as the systolic pressure the cuff pressure which prevails when said trigger circuit produces at least a second output pulse within a predetermined time interval and, after the systolic pressure is recognized, to control said gain setting means to set the second gain larger than the first gain and to recognize as the diastolic pressure the cuff pressure which prevails when an output pulse from said trigger circuit is not followed by another output pulse within said time interval.

4,476,877

FLUID TEMPERATURE SENSOR

John M. Barker, Port Hueneme, Calif., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Aug. 16, 1982, Ser. No. 408,080
Int. Cl.³ A61B 5/02
U.S. Cl. 128—736 **18 Claims**



1. For use in a flow system such as a cardiovascular flow measuring system wherein a cold injectate fluid is delivered in a known amount from a supply through a catheter into a patient's blood vessel and the resultant change in the temperature of the patient's blood is sensed to determine the circulatory blood flow rate, an improved injectate fluid temperature sensor comprising:

a disposable housing defining a through lumen for conducting injectate fluid therethrough;

a disposable thermally conductive enclosure hermetically sealingly joined to the housing and projecting transversely into said lumen to be in heat transfer association with injectate fluid conducted through said lumen; and

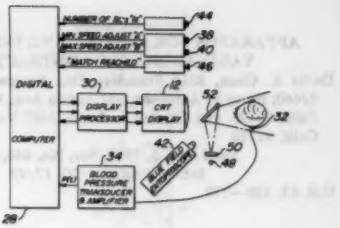
a reusable temperature sensor removably installed in said enclosure, said sensor providing a signal corresponding accurately to the temperature of the injectate fluid conducted through said lumen.

4,476,878

BLOOD VELOCITY MEASUREMENT IN RETINAL CAPILLARIES UTILIZING THE BLUE FIELD ENTOPTIC PHENOMENON

Charles E. Riva, and L. Benno Petrig, both of Myrin Clr., 51 N. 35th St., Philadelphia, Pa. 19104

Division of Ser. No. 306,699, Sep. 29, 1981, Pat. No. 4,425,924.
This application Sep. 16, 1983, Ser. No. 516,385
Int. Cl.³ G01P 3/36
U.S. Cl. 128—745 **8 Claims**



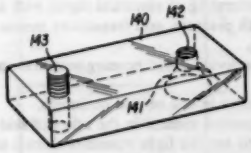
1. Apparatus for use in conjunction with an entoptoscope to determine the speed of leukocytes in retinal capillaries, comprising means for producing a visual display which simulates the appearance of entoptically seen leukocytes, said means for producing a visual display having selectively adjustable controls for adjusting the speed and number of the simulated leukocytes.

4,476,879

APPARATUS FOR AND METHODS OF COLLECTING URINE FROM LABORATORY ANIMALS

André J. Jackson, 3978 Woodhue Pl., Alexandria, Va. 22309

Filed Oct. 26, 1981, Ser. No. 314,776
Int. Cl.³ A61B 5/00
U.S. Cl. 128—760 **17 Claims**



4. An apparatus for collecting urine from a laboratory animal, the apparatus comprising:

a container of a selected length and width defining a perimeter enclosing a selected area, the container having a chamber for accumulating urine as the urine is passed, the container including a top wall having an opening therethrough and being made of a hard gnaw-resistant material;

a mounting plate for mounting the container on the abdomen of the animal, the mounting plate having a length and width defining a perimeter enclosing an area no greater than, substantially parallel to and within a perimeter defined by the area of said top wall of the container; the plate having an opening therethrough which opening is aligned generally with the animal's urethra, and the plate having a first surface for abutting the abdomen of the animal;

a layer of permanent adhesive on the first surface for securing the plate to the abdomen of the animal;

a coupling having first and second parts, the first part being attached to the mounting plate; the second part being attached to the container and being positioned at a location spaced from the perimeter of the container a sufficient distance to position the container in substantial overlap-

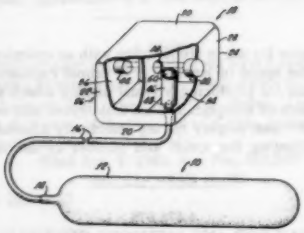
ping relationship with the mounting plate upon connecting the coupling, whereby the hard container shields the mounting plate, preventing the animal from chewing the mounting plate, and whereby the container can be detached from the mounting plate for emptying.

4,476,880

APPARATUS FOR SENSING AND INDICATING VAGINAL MUSCLE CONTRACTION

David A. Giem, 2315 Francisco Dr., Newport Beach, Calif. 92660; Barry L. Aaronson, 521 Acacia Ave., Corona Del Mar, Calif. 92625, and Charles K. Jones, 3607 Valle Vista, Chino, Calif. 91710

Filed Dec. 3, 1982, Ser. No. 446,475
Int. Cl.³ A61B 5/00, 17/42
U.S. Cl. 128—778 5 Claims



1. Apparatus for use in exercising or measuring strength of vaginal muscles comprising

a flexible, hollow tubular member adapted to be compressed in response to vaginal muscle contraction,

transducer means responsive to pressure in said tubular member for generating an electrical signal with a magnitude that varies with pressure, said transducer means comprising

a housing,

a partition dividing said housing into first and second chambers,

a light source in one of said chambers,

a photosensitive resistor in the other of said chambers positioned to receive light transmitted from said source,

an aperture in said partition for transmitting light from said source to said photosensitive resistor,

means in said housing responsive to pressure in said tubular member for controlling the amount of light received by said photosensitive resistor,

said means for controlling the amount of light comprising a pressure tube in said housing having an end adjacent said aperture, said pressure tube being in fluid communication with the interior of said tubular member, and a flexible diaphragm secured to and sealing said end of said pressure tube and adapted to flex so as to progressively block said aperture as pressure in said pressure tube increases,

said diaphragm flexing being subject to hysteresis and having a nonlinear relation to pressure, means responsive to the resistance of said photosensitive resistor for generating said electrical signal and for modifying said electrical signal to compensate for said hysteresis and nonlinearity,

and indicator means responsive to the compensated electrical signal for providing an indication of intensity of muscle contraction.

4,476,881

MICROBIAL DIGESTION OF TOBACCO MATERIALS USING MIXED CULTURES

Lawrence E. Gravely, Louisville, Ky., and Vernon L. Geiss, Georgetown, Ind., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed May 9, 1983, Ser. No. 493,121
Int. Cl.³ A24B 15/20, 15/24, 15/28
U.S. Cl. 131—308 8 Claims

1. A method for digestion of tobacco plant materials employing a mixed culture of bacteria and fungi which comprises:

(i) mixing a selected quantity of water slurry of tobacco material with a selected quantity of pectolytic enzyme producing microorganisms and a selected quantity of a cellulase producing fungi;

(ii) aerating the mixture, and;

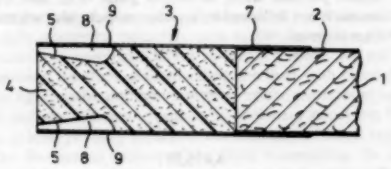
(iii) removing digested tobacco from the slurry.

4,476,882

TOBACCO SMOKE FILTERS

John A. Luke, Hampshire, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Feb. 7, 1983, Ser. No. 464,310
Int. Cl.³ A24D 3/04
U.S. Cl. 131—336 20 Claims



1. In a smoke filter including:

(a) rod-like filter plug means of filtration material having a mouth end;

(b) airflow duct means at the periphery of said filter plug means; and

(c) means defining an outlet opening of said airflow duct means at the mouth end of said filter plug means and an inlet opening spaced from the mouth end;

the improvement wherein:

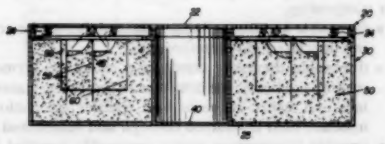
(d) said airflow duct means has a region in which said airflow duct means has a depth, measured radially of the filter plug means, which progressively decreases along the airflow duct means in a direction towards said mouth end of the filter plug means.

4,476,883

CONTAINER ASSEMBLY

Daniel Diaz, 5376 W. 14th La., Hialeah, Fla. 33012

Filed Sep. 15, 1983, Ser. No. 532,550
Int. Cl.³ A45D 29/00
U.S. Cl. 132—73 9 Claims



1. A container assembly of the type designed for the application of a predetermined liquid to a person's fingernails, said container assembly comprising:

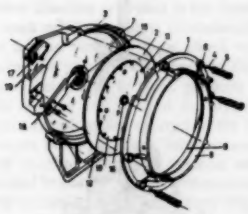
housing means including a base and an open end disposed opposite to said base, cover means dimensioned and configured to cover said open end, said housing means defining an interior of predetermined configuration; sponge material means disposed within said housing interior and substantially conforming to said housing interior configuration, a plurality of recesses integrally formed in an exposed surface of said sponge material means, each of said recesses comprising a depressed surface disposed below said exposed surface of said sponge material means and configured to receive a fingertip therein; said recesses include a first cut extending from said exposed surface of said sponge material means down into the interior thereof to a depth greater than that of said recesses and further disposed to define a frontmost boundary of said respective recesses; said first cut defining a wall portion disposed in abutting relation to a front edge of said recesses and in separable relation thereto, a separable junction formed between said wall portion and said front edge of said recesses; said recesses being structured to pass a fingernail through said junction between said wall portion and said front edge, wherein each of said recesses comprises a substantially concave configuration extending from said front edge of each of said recesses, disposed beneath the exposed surface of said sponge material means, to a rearmost edge disposed coplanar with said disposed surface of said sponge material means, whereby liquid to be applied is disposed within said housing interior and said sponge material means and filled to a level substantially equal to the bottom of said recess.

4,476,884

ROTARY PAYOUT DEVICE FOR RECREATIONAL MACHINES

Pedro A. Gonzalez, Rius Carrió, 33, Hospitalet de Llobregat (Barcelona), Spain

Filed Nov. 12, 1982, Ser. No. 440,851
Claims priority, application Spain, Nov. 18, 1981, 261.942[U]
Int. Cl.³ G07D 9/04
U.S. Cl. 133—4 A **4 Claims**



1. Rotary payout device for recreational machines, characterized by the fact that it comprises a cover, a disk and a casing, the cover and casing being held together by six spring-loaded screws, with the springs in contact with the under sides of the screw heads and the cover, making the joint between casing and cover flexible.

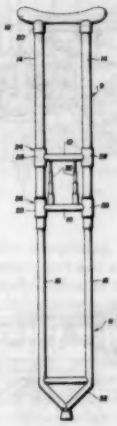
4,476,885

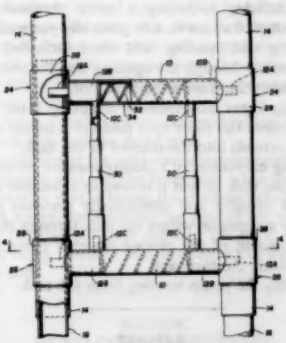
ADJUSTABLE CRUTCH

Joseph L. Stein, 9551 Old Creek Dr., Fairfax, Va. 22032

Filed Sep. 30, 1982, Ser. No. 432,093
Int. Cl.³ A61H 3/00
U.S. Cl. 135—69 **6 Claims**

1. An adjustable crutch assembly comprising an upper portion, a lower portion and a middle locking, adjustment and handle assembly mounted on said upper portion, said crutch assembly being of dual tubular construction with the upper ends of two main tubes of the lower portion being telescopically fitted into the open lower ends of two main tubes of the upper portion and of the middle assembly, said middle assembly comprising a lower cross member fixed to and adjacent the ends of said main tubes of said upper portion and an upper cross member slidably mounted on said main tubes of said upper portion, said upper member comprising an adjustable height handle of said crutch assembly, extendable means interconnecting said upper and lower cross members; and interlock means associated with each cross-member for adjustably and simultaneously joining said upper and lower crutch portions





together in any one of a plurality of selected adjusted positions with respect to each other, and said upper cross member with respect to said lower cross member and with respect to said upper and lower crutch portions in any one of said selected adjustable positions; whereby simultaneous operation of said interconnecting means and of said interlock means permits either assembly or disassembly of said crutch overall or height adjustment of said crutch coupled with simultaneous adjustment of the height of said handle in said middle assembly both in a single action.

4,476,886

AFFIXATION OF A PUMP TO A TANK

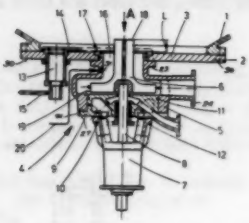
Toivo Niskanen, Hamina, and Raimo Fellman, Heinlahti, both of Finland, assignors to Kamyr AB, Karlstad, Sweden

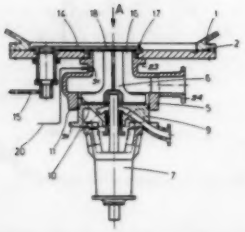
Filed Dec. 6, 1982, Ser. No. 447,211

Claims priority, application Finland, Dec. 15, 1981, 814016

Int. Cl.³ F04B *23/00*

U.S. Cl. 137—15 **20 Claims**





17. A method of detaching a centrifugal pump housing from a tank containing a suspension or a liquid, said tank having an opening formed in a generally horizontal portion thereof, and said pump housing including a rotor mounted interiorly thereof for rotation about an axis generally perpendicular to a plane defining said opening, said rotor including a portion thereof extending through the opening into the interior of the tank, comprising the steps sequentially of:

(a) effecting linear movement of the pump rotor along said axis to move the rotor to a position wherein no portion thereof extends into the interior of the tank;

(b) effecting movement of a closing member mounted interiorly of the tank so that it moves to a position closing off the tank opening and substantially prevents passage of liquid or suspension within the tank through the opening, the movement of the closing member being controlled from outside the tank; and

(c) detaching the pump housing from the tank.

4,476,887

HYDRAULIC GOVERNOR PRESSURE GENERATOR

Koji Sumiya, Nishio, Japan, assignor to Aisin Warner Kabushiki Kaisha, Aichi, Japan

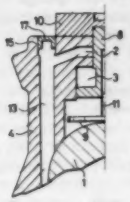
Filed Feb. 12, 1982, Ser. No. 348,310

Int. Cl.³ G05D *13/08*

U.S. Cl. 137—56 **2 Claims**

1. A hydraulic governor pressure generator including a governor body fixedly mounted on a rotational shaft, a governor valve movably mounted in a cavity of the governor body in the radial direction with respect to the rotational shaft according to centrifugal force acting thereon, an input oil passage and an output oil passage provided in the valve body communicating with each other through a clearance between the inner peripheral wall surface of said governor body and the outer peripheral wall surface of said governor valve, said hydraulic governor pressure generator comprising:

at least one pocket provided in each one of said input and output oil passages and recessed in a direction away from the rotational center of said rotational shaft, the diameter thereof being larger than that of said input or output oil



passage, one end thereof being opened in a surface of said governor body, and

a magnet fixed in each one of said pockets so as to close said one end thereof, whereby particles of swarf or foreign material in the working oil in said input and output passages are collected in said pockets by means of magnetic forces as well as centrifugal force.

4,476,888

OVERPRESSURE VALVE

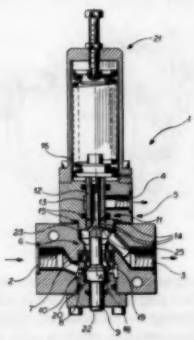
Helmüt Lachmann, Essen, and Bernd Lange, Berlin, both of Fed. Rep. of Germany, assignors to Dr. H. Tiefenbach GmbH & Co., Essen and Borsig GmbH, Berlin, both of, Fed. Rep. of Germany

Filed Jul. 22, 1982, Ser. No. 400,669

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1981, 3131817

Int. Cl.³ G05D *16/10*

U.S. Cl. 137—102 **11 Claims**



1. An overpressure-control valve comprising:

a valve housing formed with

a vent port,

a front output chamber,

a back intake chamber adjacent and back of said output chamber, and

a valve seat lying between said chambers;

a valve body displaceable in said housing forward toward said valve seat into a closed position on said seat and blocking flow between said chambers and backward from said valve seat and into an open position permitting flow between said chambers, said body having exposed in said chambers at least one forwardly directed face and at least one backwardly directed face, the effective surface area of said for-

wardly directed face being greater than that of said backwardly directed face;

vent valve means connected to said valve body and openable after said valve body is displaced into said closed position for connecting said output chamber to said vent port; and

biasing means for urging said valve body backward into said open position with a predetermined generally constant biasing force, whereby said valve body moves back against said biasing means into said closed position when the backwardly effective pressure on the forward face overcomes both the force of said biasing means and the pressure on the back face.

4,476,889

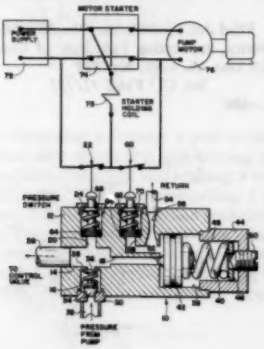
CONTROL VALVE AND SWITCH ASSEMBLY

Henry T. Haynes, 6463 S. 32nd W. Ave., Tulsa, Okla. 74123

Filed Apr. 7, 1981, Ser. No. 251,895

Int. Cl.³ G05D *16/20*

U.S. Cl. 137—116.3 **6 Claims**



1. A control valve and switch assembly comprising a housing, a pressure chamber provided in the housing for directing fluid for a work operation and in communication with a pressure source and an outlet passage, check valve means interposed between the pressure chamber and the pressure source for precluding back flow of fluid, pressure bore means provided in the housing and open to the pressure chamber, primary pressure switch means secured to the housing and open to the pressure bore, unloader valve means secured to the housing and open to the outlet passage, return passageway means provided in the housing in communication between the unloader valve means and a fluid return line, second pressure bore means provided in the housing in communication between the unloader valve means and a fluid return line, second pressure bore means provided in the housing and open to the return passageway means, secondary pressure switch means secured to the housing and open to the second pressure bore means, said primary pressure switch means being operably connected between a power supply and a motor starter and responsive to the pressure in the pressure chamber for alternately opening and closing the operable connection between the power supply and motor starter, said secondary pressure switch means being operably connected between the motor starter and a motor driven pump providing said pressure source and open to the pressure in the return passageway means downstream of the unloader valve means for alternately opening and closing the operable connection between the motor starter and the pump motor, and said unloader valve being responsive to the pressure in the outlet passage for providing selective communication between the outlet passage and the return passageway means for automatically controlling the pressure within the pressure chamber within predetermined operating limitations.

4,476,890

PRESSURE CONTROL VALVE

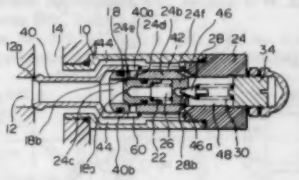
Haruhiko Kawasaki, Sagamihara, and Keiji Ushiro, Tokyo, both of Japan, assignors to Kayaba Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1982, Ser. No. 387,300

Claims priority, application Japan, Jun. 12, 1981, 56-90535; Jun. 12, 1981, 56-86314[U]

Int. Cl.³ F16K *17/18*

U.S. Cl. 137—269 **13 Claims**



1. A pressure control valve comprising, in combination:

a housing defining a pressure port and a relief port;

a valve body fixedly accommodated in the housing;

a relief poppet biased to block communication between the pressure port and the relief port, the relief poppet and the valve body defining a part of a back pressure chamber, a first end of the relief poppet communicating with the pressure port and a second end of the relief poppet communicating with the back pressure chamber;

a plug defining a pilot poppet chamber on one side and the other part of the back pressure chamber on the other side;

a pilot poppet accommodated in the pilot poppet chamber and biased to block communication between the back pressure chamber and the relief port, the pilot poppet being moved when a pressure in the back pressure chamber is above a biasing force to unblock communication between the back pressure chamber and the relief port;

an anti-void poppet having the valve body slidable therein, the valve body being formed with a port for communicating the pressure port with the relief port through the anti-void poppet, the anti-void poppet being biased to unblock communication between the pressure port and the relief port when the pressure in the presence port is below a predetermined value;

a relief spring for blocking communication between the pressure port and the relief port;

an anti-void spring for unblocking communication between the pressure port and the relief port when the pressure in the pressure port is below the predetermined value; and

a waved washer neighboring the port of the valve body to guide the flow of fluid through the port, the anti-void spring being disposed between the wave-washer and the valve body.

4,476,891

MULTI-COMPONENT VALVE

Piero Mulas, Via Dodecaneso 50/6, and Giancarlo Bonissone, Piazza Paola Da Novi 7/77, both of Genoa, Italy

Filed Feb. 23, 1982, Ser. No. 351,358

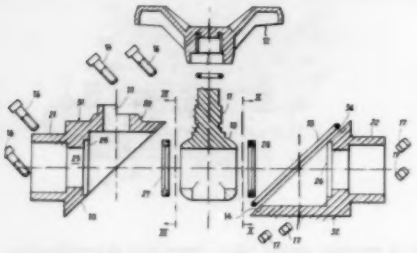
Claims priority, application Italy, Mar. 20, 1981, 12475 A/81

Int. Cl.³ F16K *5/06*

U.S. Cl. 137—270 **5 Claims**

1. A convertible valve comprising, a valve body having two interconnectable body sections assemblable together into a valve body, each body section having a cavity for jointly defining in an assembled condition of the two valve sections an inner cavity for housing a rotary valve element therein, each body section having a nipple portion having a bore therethrough for passage of fluid from one nipple portion to the other through the valve and for connection to conduits, a

rotary valve element housable in said cavity and having an open-ended first bore passing at an angle through an axis of rotation of the valve element, the rotary valve element having an open-ended second bore having an end open to said first bore, the rotary valve element having an operating spindle extending therefrom, one of said body sections having an opening into the cavity thereof for receiving said spindle extending therethrough outwardly of the assembled valve body for selective actuation of the rotary valve element about the axis of rotation thereof for opening and closing the valve, the



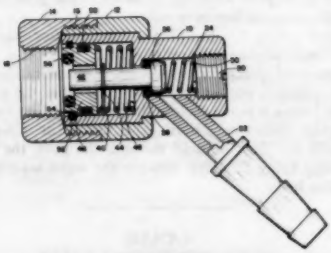
valve sections having complementary surfaces for abutting each other in an assembled condition of the two valve body sections, at least a part of each of the complementary surfaces being disposed in a common plane passing at an angle through said axis of rotation of the rotary valve element, one of the body sections being positionable alternatively in positions with the nipple portion thereof aligned and in communication with said first or with said second bore of the rotary valve element, and means for connecting the two valve sections in an assembled condition in said positions and for disassembly thereof.

4,476,892

DUAL PURPOSE REFRIGERANT CONNECTOR

Harold L. Boyce, 1411 N. Yale, Tulsa, Okla. 74115

Filed Sep. 19, 1983, Ser. No. 533,525
Int. Cl.³ F25B *45/00*
U.S. Cl. 137—322 **1 Claim**



1. A coupling for safely opening a normally closed Schroeder or standard service valve which is connected to the refrigerant fluid of a compressor-type air conditioning system comprising:

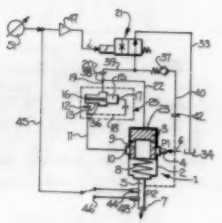
a body having a coaxial first bore and, forward thereof, a second bore with an axial communication port of smaller diameter than said first and second bores therebetween, means to connect a source of high pressure refrigerant fluid to said first bore and means to connect a body of said valve with said second bore, a first piston in said first bore, said first piston having an attached rod which extends into said second bore through said port, means to seat said first piston on its rod side to a surface that surrounds said first bore to normally close said port, spring means biasing said piston to the seated position, a second piston sealed in said second bore having an opening coaxially larger than said rod to reciprocally receive at least a portion of said rod therein, means biasing said second piston towards said means to connect with said valve, means on the forward end of said second piston to seal with said body which is a part of said valve prior to said valve being opened and prior to the movement of said first piston off of said seat for admittance of said high pressure refrigerant fluid through said port by the movement of said first piston, and a stop ring attached to said rod and situated in said second bore to be engaged by said second piston upon movement of said second piston to move said first piston away from its seat.

4,476,893

HYDRAULIC FLOW CONTROL VALVE

Hans Schweim, Kaarst, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Jul. 2, 1981, Ser. No. 279,780
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1980, 3025315; Dec. 16, 1980, 3047244
Int. Cl.³ F16K *31/122*
U.S. Cl. 137—486 **17 Claims**



1. A hydraulic flow control valve comprising

a housing having a bore therein,

a hydraulic inlet channel and a hydraulic outlet channel, each communicating with said bore in said housing,

valve means mounted in said bore for movement between a closed position closing communication between said inlet and outlet channels, and an open position permitting such communication,

adjustable control means for biasing said valve means toward one of either its closed or open positions, and including,

(a) constant volume flow restriction means for providing a constant volume hydraulic flow,

(b) a first line connected downstream of said constant volume flow restriction means,

(c) adjustable transducer means operatively connected to said first line for maintaining a selected pressure therein,

(d) an outlet line leading from the downstream side of said transducer means to an external reservoir,

(e) a second line connected downstream of said constant volume flow restriction means and parallel to said first line, said second line leading to said bore in said housing and so that the pressure in said second line is adapted to bias said valve means toward one of either its closed or open positions,

(f) flow sensor means and pressure sensor means positioned in said outlet channel, and

(g) feedback means operatively interconnecting each of said flow sensor means and said pressure sensor means with said transducer means, and including switch means for selectively connecting either said flow sensor means or said pressure sensor means to said feedback means, whereby the output of either said flow sensor means or

said pressure sensor means acts to control the pressure in said second line and thus positioning of said valve means.

4,476,894

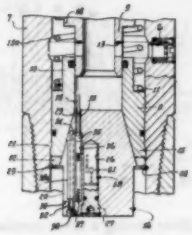
VALVE WITH CIRCULATION TIMER

Robert L. Alder, Irvine, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jun. 23, 1982, Ser. No. 391,412

Int. Cl.³ F16K *37/00*

U.S. Cl. 137—552.7 **6 Claims**



5. A valve comprising a housing, a port in said housing, a piston sleeve movably mounted in said housing, a port in said piston sleeve, a second sleeve in said housing, a timer mounted in said second sleeve, said timer comprising a semi-circular housing section, a chamber bored in said semi-circular section, a plug for said bore, a groove in the exterior of said section, a battery, a magnetic switch and a time responsive device in said chamber, a trigger rod in said groove extending from the end of said container, a magnet in said groove mounted on said trigger rod.

4,476,895

SHORT GIRDLE

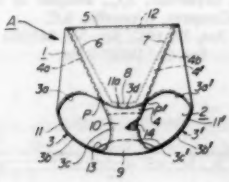
Masaru Shibusawa, Kyoto, Japan, assignor to Wacoal Corp., Kyoto, Japan

Filed Jan. 31, 1983, Ser. No. 462,358

Claims priority, application Japan, Aug. 17, 1982, 57-142894

Int. Cl.³ A41C *1/00*

U.S. Cl. 128—546 **3 Claims**



1. A short girdle formed of elasticized material comprising:

a front body formed with front leg hole portions located on opposite sides of a lower edge thereof;

a rear body formed with rear leg hole portions located on opposite sides of a lower edge thereof;

an abdomen keep cloth member sewed to one of front and rear side surfaces of the front body and extending downwardly from an upper edge of the front body toward a central portion of its lower edge in such a manner that the width thereof is successively reduced; and

a crotch cloth member consecutively extending downwardly from the abdomen keep cloth member and connected at one end thereof to a central portion of the lower edge of the rear body, said crotch cloth member being formed with inner leg hole portions each located on one of opposite sides thereof;

the lower edge of the front body and side edges of the abdomen keep cloth member contiguous with side edges of the crotch cloth member crossing each other and overlapping in such a manner that they are able to move relative to each other.

4,476,896

MANIFOLDS FOR STRUTTED FILM

Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Division of Ser. No. 319,761, Nov. 9, 1981, Pat. No. 4,425,172. This application Apr. 27, 1983, Ser. No. 488,892

Int. Cl.³ B05B *1/14*

U.S. Cl. 137—561 A **10 Claims**

1. A manifold for a strutted film having internal flow passageways comprising, in combination:

a conduit having an internal passageway; and

a strutted film adhesively joined to and wound about said conduit at least about 1–1¼ revolutions;

wherein the internal passageway of said conduit communicates with said flow passageways through a coupling orifice having an external opening which is sealed by a patch.

4,476,897

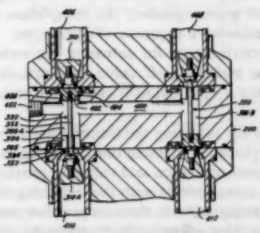
FLOWLINE CONNECTOR SEAL

Charles D. Morrill, Bellaire, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Division of Ser. No. 87,747, Oct. 24, 1979, abandoned, which is a continuation-in-part of Ser. No. 973,895, Dec. 28, 1978, abandoned. This application Jul. 16, 1982, Ser. No. 399,008

Int. Cl.³ F16L *29/00*

U.S. Cl. 137—594 **38 Claims**



1. A seal plate for sealingly engaging two opposing fluid line hubs, the hubs each having at least one port with a fluid line attached thereto and at least one of such ports having valve means therein for closing off the corresponding fluid line, comprising:

a flangeless disc-like metal body member insertable between such hubs having a diameter larger than its thickness;

fluid communication means through said body member for providing fluid communication between the fluid lines of such hubs;

means on each face of said body member for sealingly engaging each one of the hubs; and

guidance means disposed in said fluid communication means engageable with such valve means upon insertion of said body member between such hubs for opening such valve means and permitting the fluid flow through said fluid communication means.

4,476,898

MINE-ROOF SUPPORT CONTROL MEANS

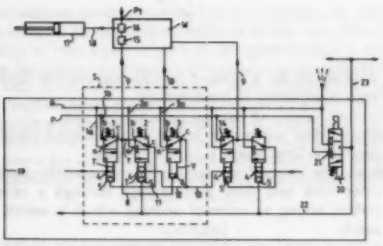
Karl Krieger, Wuppertal, and Günther Kuschke, Castrop-Rauxel, both of Fed. Rep. of Germany, assignors to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Mar. 19, 1982, Ser. No. 359,940

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110854

Int. Cl.³ F15B 9/10

U.S. Cl. 137—624.14 4 Claims



1. Mine-roof support control means comrising:

(a) a main control unit incorporating a pressure-controlled valve;

(b) a workstage control device connected thereto and comprising a 3/2 switching-on valve, a 3/2 switching-off valve and a 3/2 transmitting valve, said 3/2 valves of the control device being alternately connectable to a high-pressure fluid line and to a low-pressure fluid return line in order to convert a pressure pulse into a switching step at the main control unit and for transmitting an answering pressure pulse signalling the completion of a workstage for continuing a sequence of operations;

(c) respective means for actuating the switching-on valve and the switching-off valve, said actuating means each including a fluid cylinder containing twin operating pistons;

(d) means for actuating the transmitting valve comprising a fluid cylinder containing one operating piston;

(e) fluid connections on said valves to provide for the return line to communicate with the switching-on valve and the transmitting valve in their inoperative positions and with the switching-off valve in its operating postion; and

(f) fluid connections between the switching-on valve, the switching-off valve and the transmitting valve to ensure that, when a first one of the two actuating pistons of the switching-on valve is acted on by a pressure pulse, the switching-on valve communicates with the high pressure line and leads pressurised fluid to said pressure-controlled valve in the main control unit which actuates the workstage through the opened switching-off valve to the second actuating piston of the switching-on valve and to the actuating piston of the transmitting valve which opens to transmit the answering pressure pulse.

4,476,899

BRAKING MECHANISM FOR A SHED-FORMING MACHINE

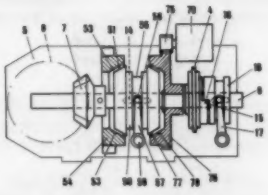
Rudolf Schwarz, Horgen-Zuerich, and Walter Kleiner, Hirzel-Zuerich, both of Switzerland, assignors to Staeubli Ltd., Horgen-Zuerich, Switzerland

Filed Sep. 27, 1982, Ser. No. 425,137

Claims priority, application Switzerland, Nov. 13, 1981, 7286/81

Int. Cl.³ D03D 51/08

U.S. Cl. 139—1 E 16 Claims



1. In a weaving machine having a drive mechanism, a lifting unit, a shed-forming mechanism which has a rotatably supported shaft and has selectively actuable braking means for resisting rotation of said shaft, first means adapted to drivingly couple said drive mechanism of said weaving machine to said shaft of said shed-forming mechanism, and second means adapted to drivingly couple said shaft of said shed-forming mechanism to said lifting unit, the improvement comprising wherein said braking means includes: a first member which is axially movably supported on and fixed against rotation relative to said shaft, and which has a first annular braking surface thereon coaxial with said shaft; means defining a second annular braking surface which is coaxial with and fixed against axial movement with respect to said shaft; means for preventing rotation of said second annular braking surface about the axis of said shaft; and actuating means cooperable with said first member for effecting axial movement of said first member between two positions in which said first and second annular braking surfaces are respectively engaging and spaced from each other.

4,476,900

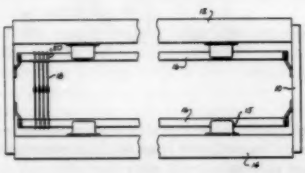
COMPOSITE HEDDLE ROD

James B. Bowen, Greenville, S.C., assignor to Steel Heddle Manufacturing Company, Greenville, S.C.

Filed Jan. 27, 1982, Ser. No. 343,051

Int. Cl.³ D03C 9/06

U.S. Cl. 139—91 8 Claims



1. In a heddle frame having top and bottom frame slats, heddle rods carried by said frame slats which support heddles having end slots carried on said heddle rods, the improvement wherein said heddle rods comprise:

a first elongated metal bar;

a second elongated metal bar laterally spaced from said first bar and being carried parallel to said first bar;

a non-metallic inner core interposed between said first and second bars;

means for securing said first and second metal plates and said

intermediate non-metallic layer together in a sandwiched configuration; and

means connecting said heddle rods to said frame slats.

4,476,901

APPARATUS FOR DETECTING WEFT YARN IN JET LOOMS

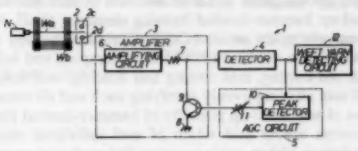
Tsutomu Sainen, Kanazawa, Japan, assignor to Tsudakoma Corporation, Ishikawa, Japan

Filed Jun. 23, 1983, Ser. No. 507,425

Claims priority, application Japan, Jun. 30, 1982, 57-114168

Int. Cl.³ D03D *51/31*

U.S. Cl. 139—370.2 **5 Claims**



1. An apparatus for detecting a weft yarn in a loom, comprising:

(a) a feeler head for detecting whether a weft yarn has been inserted in a warp shed at an end of the warp shed and for generating an electric feeler signal;

(b) a variable-gain amplifier for amplifying said electric feeler signal; and

(c) an automatic gain control circuit for detecting the level of an output signal from said variable-gain amplifier and for feeding an automatic gain control signal proportional to the detected level back to said variable-gain amplifier to change the operating point thereof to thereby control said output signal from said variable-gain amplifier so as to be substantially constant.

4,476,902

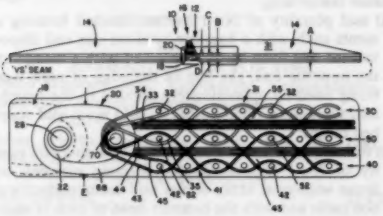
IN-LINE PINTLE LOOP SEAM

William T. Westhead, Waycross, Ga., assignor to Scapa Inc., Waycross, Ga.

Filed Aug. 13, 1982, Ser. No. 408,010

Int. Cl.³ F16G *3/02*; D21F *7/10*

U.S. Cl. 139—383 A **13 Claims**



1. A papermakers fabric having two ends joined together by a seam, said fabric comprising:

a first layer defined by a first plurality of weft yarns;

a second layer defined by a second plurality of weft yarns;

a plurality of warp yarns interwoven with said weft yarns to define a first surface on said first layer and a second surface on said second layer, a select number of said warp yarns extending out of each end of said fabric;

a first spiral coil and a first stuffer pick disposed across said warp yarns at one end of said fabric; and

said select number of warp yarns being sewn back directly into the fabric between said first and second layers after passing around elected portions of at least one of said spiral coil and said stuffer pick, whereby all the elements constituting the seam are generally in line with the tension plane through the fabric.

10. A method of producing a seam in a multiple layer papermakers fabric comprising the steps of:

determining the place on the fabric where a spiral coil is to be inserted;

removing a predetermined number of weft yarns in each layer of the fabric at said place;

fraying out the ends of the fabric by removing a predetermined number of weft yarns and temporarily leaving a certain number of weft yarns immediately next to the area where the spiral is to be inserted;

taking a predetermined number of the warp yarns of a design repeat, passing them around the spiral, and sewing them directly into the fabric between the face and back layers of the fabric, thereby protecting said warp yarn from wear and eliminating a source of seam failure; and

causing the sewn back warp yarns to emerge from exit points on at least one of the face and back surfaces of the fabric.

4,476,903

SHUTTLELESS WEAVING MACHINE

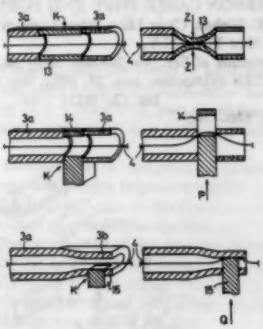
Paul Gunneman, Mierlo, Netherlands, assignor to Ruti-te Strake B.V., Deurne, Netherlands

Filed Jan. 13, 1982, Ser. No. 339,087

Claims priority, application Switzerland, Jan. 13, 1981, 196/81

Int. Cl.³ D03D *47/34*

U.S. Cl. 139—435 **8 Claims**



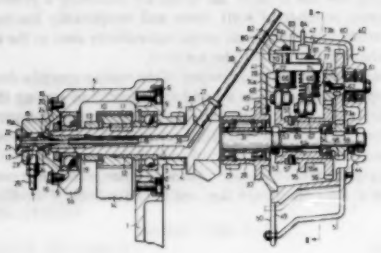
1. A shuttleless weaving machine, comprising a nozzle for inserting a weft thread from a stationary yarn supply, said nozzle provided with a mixing tube mounted in alignment with a guide channel for the weft thread, said machine further comprising a reed carried by a batten for beating-up the inserted weft thread, and a thread holder disposed between the yarn supply and the reed, the thread holder being disposed directly within the mixing tube wherein the thread holder is an elastic intermediate piece installed in the mixing tube, said intermediate piece being associated with two oppositely positioned reciprocable elements which are adapted to be moved with each other in a head-on fashion.

4,476,904

DEVICE FOR MEASURING THE LENGTH OF A WEFT

Tetsuo Ito, Kariya, and Shingo Oda, Nagoya, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 21, 1982, Ser. No. 451,739
Claims priority, application Japan, Dec. 26, 1981, 56-212723; Dec. 29, 1981, 56-215885
Int. Cl.³ D03D *47/36*
U.S. Cl. 139—452 10 Claims



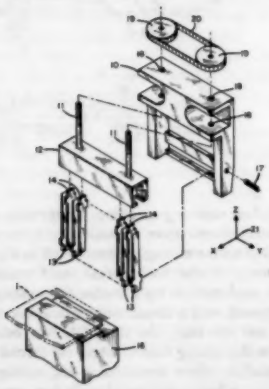
1. A device for measuing the length of a weft, comprising a length measuring drum for coilingly winding the weft supplied from a weft supply bobbin through a weft guide means, a pair of weft engaging pins mounted substantially within said drum in axially spaced apart relation with respect to the axis of said drum and for retracting and protruding movement through the periphery of said drum for controlling a winding amount of the weft onto said drum and a shift of the wound weft towards the weft drawing-out direction of said drum, a cam mechanism for alternately protruding and retracting said weft engaging pins through the periphery of said drum, and a guide means arranged between said cam mechanism and said weft engaging pins, said guide means for controlling said weft engaging pins so that they move only rectilinearly in their axial directions.

4,476,905

RIBBON CABLE WIRE END FORMING TOOL

Duane K. Maben, Clear Lake, Iowa, assignor to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 268,048, May 28, 1981, abandoned. This application Aug. 25, 1983, Ser. No. 526,509
Int. Cl.³ B21F *1/00*
U.S. Cl. 140—105 5 Claims



1. A method of positionally interrelated time-stepped motions for cutting, stripping, and end-forming an insulated multi-wire flat workpiece ribbon cable which comprises:

clamping and holding said workpiece ribbon cable while in a first position; then

end cutting said workpiece ribbon cable while still in said first position; and

cutting and holding said insulation at a location back from said cut end of said workpiece ribbon cable while still in said first position; then

stripping said cut and held insulation from said workpiece ribbon cable while pulling the stripped wire ends thereof to a second position between an anvil forming block and a forming head with a line-up plurality of hammer-headed forming elements; then

aligning an edge one of said multiple wires within said workpiece ribbon cable under an end one of said plurality of lined-up hammer-headed forming elements; then

responsively to the width of the individual one said workpiece ribbon cable subject to said clamping and holding, said end cutting, said cutting and holding, said stripping, and said aligning evenly justifying each and all remaining ones of said lined-up plurality of hammer-headed forming elements across said width of said individual one said workpiece ribbon cable in order that each and every one of said plurality of lined-up hammer-headed forming elements may be, by said justifying, better proximately juxtaposed oppositely the multiple wires of said multi-wire flat workpiece ribbon cable; then

compressively forming said stripped wire ends by pressing said anvil forming block and said forming head together.

3. An apparatus for cutting, stripping, and forming ones of a multiplicity of wires at the end of a variable width multiconductor ribbon cable, which apparatus comprises:

a frame means;

fixed and moveable cut knife means carried by frame means, said moveable cut knife means being moveable relative to said support bed and frame means, for cutting across said workpiece ribbon cable;

fixed and moveable strip knife means adjacent said cut knife means and fixed thereto for stripping the insulation from said multiplicity of wires within said workpiece ribbon cable in order to produce a multiplicity of wire ends;

form block means attached to said frame means for providing an anvil surface under said multiplicity of wire ends;

forming head means moveably mounted on said frame means and carrying a plurality of N+1 justifiable hammer-headed forming elements over said multiplicity of wire ends within said workpiece ribbon cable, said forming means comprising:

(a) said plurality of N+1 hammer-headed forming elements each with a hammer-head on one end disposed toward said form block means and with a wedge upon the opposite end, the line of the edge of such wedge being lined-up approximately parallel to the length of said workpiece ribbon cable as held upon said support bed means;

(b) forming head frame means for maintaining said plurality of N+1 hammer-headed forming elements as a linear sequential array across said multiconductor ribbon cable and with the hammer-head of each of each of said N+1 hammer-headed forming elements disposed toward said form block means; and

(c) a plurality of N separator knife means for wedging apart by being forced between the wedge ends of said plurality of N+1 hammer-headed forming elements maintained as a linear sequential array, each adjacent ones of all said plurality of N+1 hammer-headed forming elements until all said plurality of N+1 hammer-headed forming elements do precisely subtend said variable width of said multiconductor ribbon cable, thereby justifying said plurality of N+1 hammer-headed forming elements over said multiplicity of wire ends within said workpiece ribbon cable; and

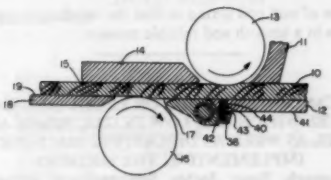
compression forming force means connected to said frame

and said forming head for forcing said forming head means and said form block means together, therefore since said form block means are, during said providing, of fixed position relative to said support bed and frame means forcing said forming head means together toward said support bed and frame means with said workpiece ribbon cable fixedly held thereon, in order to, by said forcing, form said multiplicity of wire ends within said workpiece ribbon cable.

4,476,906
YIELDING PRESSURE BAR FOR WOOD PLANING MACHINES

William B. Crawford, and Brian D. Barber, both of Greensboro, N.C., assignors to Newman Machine Company, Inc., Greensboro, N.C.

Filed Sep. 9, 1983, Ser. No. 530,638
Int. Cl.³ B27C 1/00
U.S. Cl. 144—116 5 Claims



1. A wood planer having at least one cutterhead and a bottom, a top pressure bar in spaced horizontal relation to said cutterhead, a board holddown member in advance of said cutterhead, an adjustable table and assembly having a bed plate having spaced recesses thereunder mounted thereon for supporting a board to be planed, the improvement comprising a yielding pressure bar means for automatic cut control mounted to cooperate with said bed plate, said yielding pressure bar means having a shaft supported on said adjustable table and assembly, a bar having at least one member pivotally mounted on said shaft, said bar member having a rearwardly projecting surface for engaging a board in a directed path of travel, said bar member having a forwardly projecting abutment, means for resiliently urging said rearwardly projecting surface upwardly against said first pressure bar and said cutterhead for engaging a board being conveyed through said planer during planing.

4,476,907
ANTISKID DEVICE FOR TIRE

Chuichiro Odawara, 49-1, Kamiikarida, Naganawashiro, Hachinoe-City, Aomori-Prefecture, Japan

Filed Dec. 27, 1982, Ser. No. 452,948
Claims priority, application Japan, Dec. 28, 1981, 56-193059[U]; Jan. 9, 1982, 57-893[U]
Int. Cl.³ B60C 27/06
U.S. Cl. 152—179 12 Claims

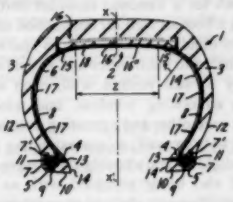
1. An antiskid device for a tire comprising a tread portion, a pair of shoulder portions and a pair of side wall portions formed of elongated plate material in one piece, said tread portion being corrugated in a radial direction of a tire on which the device is mounted, said tread portion and said shoulder portions and said shoulder portions and said side wall portions forming obtuse inner angles, said side wall portions each being formed with a coiled portion at its end, and said shoulder portions each being formed with a metal stop member for hitching a tire chain system thereon.

5. An antiskid device for a tire comprising a side chain, a cross chain, a connector, an end link, a hook and a stopper, wherein said side chain comprises a plurality side links each formed as a two-piece link including two links, one a long link and the other a short link, which are integral with each other, said stopper being angled in transverse section and formed with a transverse web of a width large enough to contact a lower portion of said end link, and a groove of a width large enough to receive said hook, said cross chain being formed as a cross link of bar material, said connector being in the form of a link on either end and in the form of a rod in its intermediate portion so that the connector is connected at one end to said cross link and at the other end to said side link.

4,476,908
REINFORCEMENT FOR TIRES PRODUCED BY MOLDING

Jean P. Cesar, Sayat; Jacques Gouttebessis, La Mouteyre, and Andre Schneider, St-Hyppolyte, all of France, assignors to Companie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation-in-part of Ser. No. 275,363, Jun. 19, 1981, abandoned. This application Aug. 9, 1983, Ser. No. 521,712
Claims priority, application France, Jun. 24, 1980, 80 14060
Int. Cl.³ B60C 9/00
U.S. Cl. 152—357 A 11 Claims



1. A tire produced from at least one liquid or paste material which solidifies in a tire mold to form the elastomeric material of the tire, consisting of a crown with two shoulders each connected to a sidewall terminating in a bead containing at least one bead ring,

characterized by the fact that it comprises a number of successive discrete radial hoops which are equally spaced apart in the longitudinal direction of the tire, are identical, consist at least in part of a moldable material, are embedded in the elastomeric material of the tire, are continuous from one bead to the other and are provided at each of their ends with a hook within which the bead ring is arranged, the hook being provided with at least one extension which extends up to a wall of the tire,

and by the fact that the hoops, which are manufactured flat, are bent or curved by bringing the bead rings towards each other in the axial direction in order to impose upon the hoops a meridian trajectory corresponding substantially to the meridian curvature of the core of the tire mold, each normal section of each hoop at any given point (N) on the imposed meridian trajectory has a moment of inertia of flexure satisfying the law

$$I_n = S \times Y_n \times \rho_n$$

I_n being the moment of inertia of flexure of the normal section of each hoop at the given point (N) on the imposed meridian trajectory of the tire mold,

S being a constant coefficient equal to the ratio of the axial bending force (P) applied to each flat hoop to the modulus of elasticity (E) of the material forming the hoop,

Y_n being the radial distance from the given point (N) on the imposed meridian trajectory to the median axis of the flat hoop,

ρ_n being the radius of local curvature at the given point (N) on the imposed meridian trajectory.

4,476,909

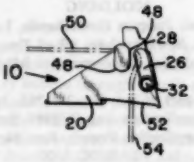
CORD LOCK FOR A VENETIAN BLIND LIFT CORD

Joseph A. Anderle, Clifton, N.J., and Victor Debs, Staten Island, N.Y., assignors to Levolor Lorentzen, Inc., Lyndhurst, N.J.

Filed Jun. 14, 1982, Ser. No. 388,158

Int. Cl.³ E06B 9/324

U.S. Cl. 160—178 C 6 Claims



1. A cord lock for a Venetian blind lift cord, comprising: a housing having a bottom wall for connection to a head channel of the Venetian blind, two side walls in spaced, substantially parallel relationship to each other and extending substantially perpendicularly to said bottom wall, each side wall being provided with an oblong window, said windows being in alignment with each other and extending at an acute angle with respect to said bottom wall, a cam extending in said housing through said windows and slidably received in said windows, each side wall also being provided with an elongated slot extending essentially vertically and at an angle with respect to said window, said slots being in alignment with each other, and a cord glide body non-rotatably but slidably mounted in said slots, said cord lock enabling a lift cord passed in said housing over said cord glide body and between said cord glide body and said cam to be releasably locked between said body and cam.

4,476,910

ROLL-BLIND

Yasuji Saito, Chiba, Japan, assignor to Kabushiki Kaisha Nichibei, Tokyo, Japan

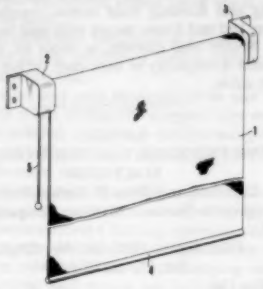
Filed Feb. 3, 1982, Ser. No. 345,367

Claims priority, application Japan, Feb. 10, 1981, 56-16773; Mar. 18, 1981, 56-36821

Int. Cl.³ E06B 9/208

U.S. Cl. 160—291 5 Claims

1. A roll-blind comprising a blind cloth, a winding roll for winding up said blind cloth thereon, a coil spring for constantly rotating said winding roll in its cloth winding-up direction, a stopper for stopping the rotation of said winding roll against the action of said coil spring at any desired position where said blind cloth is lowered, and a speed reducing device for reducing the speed of rotation of said winding roll due to the action of said coil spring while said winding roll is being continuously rotated in the cloth winding-up direction under



the action of said coil spring so that the winding-up operation continues in a smooth and reliable manner.

4,476,911

DIECASTING METHOD FOR PRODUCING CAST PIECES WHICH ARE LOW IN GAS, PORES AND OXIDES, AS WELL AS DIECASTING MACHINE FOR IMPLEMENTING THE METHOD

Edgar Lossack, Bonn; Jochen Spriestersbach, Alfter; Josef Baur, and Wilfried Schwab, both of Weingarten, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Müller-Weingarten A.G., Weingarten, Fed. Rep. of Germany

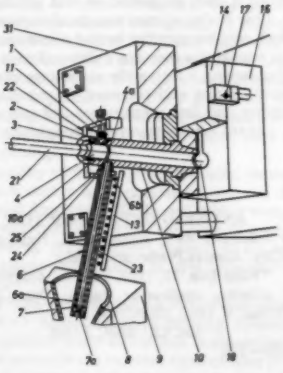
Filed Nov. 3, 1981, Ser. No. 317,617

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041340

Int. Cl.³ B22D 27/15

U.S. Cl. 164—65 38 Claims

FIG. 1



1. A diecasting process for producing cast pieces from metals or their alloys by means of a horizontal cold chamber diecasting machine including a diecasting mold held under a vacuum, a fill chamber coupled to the diecasting mold, a holding furnace containing metal melt, a suction pipe partially immersed in the holding furnace and coupled to the fill chamber, vacuum means for transporting metal melt from the holding furnace through the suction pipe into the fill chamber under a vacuum, a casting piston for moving the metal melt from the fill chamber into the diecasting mold, and a piston rod attached to the casting piston for moving the casting piston, whereby the filling of the fill chamber with metal melt constitutes a dosaging phase and during the dosaging phase gases and

lubricant vapors are developed during entry of the melt into the fill chamber, said process comprising the steps of:

providing the casting piston with an annular channel and the piston rod and casting piston with a longitudinal bore which extends from the piston rod into the casting piston and there exits into the annular channel;

connecting the longitudinal bore in the piston rod to a source of vacuum for creating a vacuum at the annular channel in the casting piston; and

maintaining a vacuum at the annular channel in the casting piston so as to cooperate with the vacuum in the mold for extracting gases and lubricant vapors from the fill chamber.

4,476,912

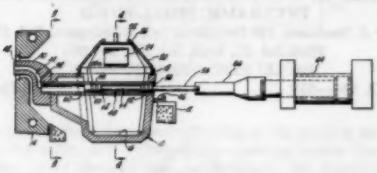
HOT CHAMBER DIE CASTING MACHINE

John I. Harvill, 24201 Orange Ave., Perris, Calif. 92370

Continuation of Ser. No. 196,319, Oct. 14, 1980, abandoned. This application Jun. 8, 1982, Ser. No. 386,340

Int. Cl.³ B22D *17/04*

U.S. Cl. 164—316 **10 Claims**



1. A hot chamber die casting machine comprising

a pot;

a hollow cylinder extending horizontally through said pot and having a first, open end on a first outer side of said pot and a second, open end on a second outer side of said pot;

a nose on the second outer side of said pot in communication with the second end of said cylinder;

a piston slidably mounted in said cylinder;

means for moving said piston axially in said cylinder;

means in said cylinder and located between said piston and said second end with said piston in the retracted position for charging said cylinder with material from said pot; said piston including a charging head, a sealing head and a rigid connecting member therebetween; and

a relief port through the wall of said cylinder and in communication with the interior of said pot, said relief port being positioned between said charging head and said sealing head when said piston is positioned for charging said cylinder.

4,476,913

ARRANGEMENT FOR PRESSURE WELDING OF A ROLLING BEARING CAGE

Hilmar Leuner, Üchtelhausen; Herbert Dobhan, Bergrheinfeld; Bernhard Bauer, Hassfurt, and Armin Olschewski, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

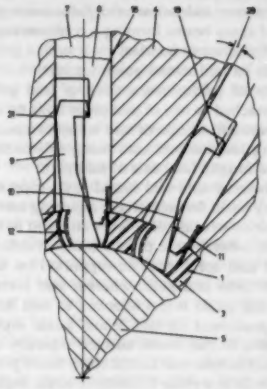
Filed Sep. 30, 1982, Ser. No. 428,731

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142047

Int. Cl.³ B22D *29/00*

U.S. Cl. 164—346 **10 Claims**

1. In an arrangement for die casting of a rolling bearing cage having pockets for rolling bodies, in a die casting mold, wherein a housing is provided covering a die casting mold, the housing having guide openings opening in the central plane of the respective pockets of the die casting mold, main and auxiliary slides being arranged side by side in each guide opening, the main and auxiliary slides having laterally facing supporting guide surfaces at their inner ends inclined to the central planes, each auxiliary slide having a lateral bulge on the side thereof opposite the guide surface, for forming one of the lateral boundary walls of the pockets with holding projections on inner and outer edges thereof for the rolling bodies, the improvement wherein each main slide is externally operable and has a recess on the side thereof toward the respective auxiliary slide, the recess having a radially inner shoulder and a radially



outer shoulder, the auxiliary slide having a holding lug extending into the recess between said inner shoulder and outer shoulder with radial play, the auxiliary slide having a supporting surface on the side opposite the lug with a radial outer boundary edge, said supporting surface extending along the boundary wall of the respective pocket and being supported on the wall of the guide opening, the auxiliary slide being pivotable about said outer boundary edge in the guide opening.

4,476,914

METHOD AND APPARATUS FOR COOLING METAL STRANDS, MORE PARTICULARLY SLAB AND BILLET STRANDS

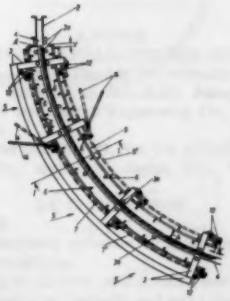
Willi Wrossok, Düsseldorf, Fed. Rep. of Germany, assignor to SACK GmbH, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 187,363, Sep. 15, 1980, abandoned. This application Feb. 5, 1982, Ser. No. 346,142

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 2939322

Int. Cl.³ B22D *11/124*

U.S. Cl. 164—444 **3 Claims**



1. A device for adjusting the secondary cooling of a continuous cast strand emerging in a longitudinal path from a continuous casting mold, to compensate for variations in the width of the strand surfaces comprising:

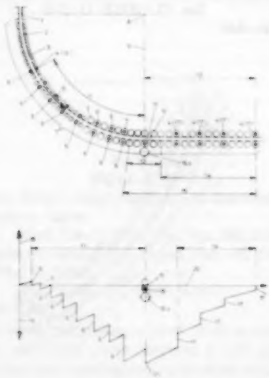
(a) a strand guide support adjacent to and substantially surrounding said path;
(b) a plurality of coolant spray nozzles positioned to define spray planes crossing said path;
(c) elongated spray beams extending substantially parallel to said longitudinal path and adjacent thereto, said spray beams including at least one lateral spray beam positioned at a side of said path and upper and lower spray beams positioned above and below said path, respectively, and each of said spray beams forming a common support for a plurality of said spray nozzles;
(d) pivot bolts on said strand guide support;
(e) a plurality of guide levers, each of said guide levers pivotally attached to one of said pivot bolts on said strand guide support and to one of said spray beams, said pivot bolts having longitudinal axes being substantially transverse to the longitudinal axis of said path;
(f) means associated with said strand guide support and said lateral spray beam for selectively adjusting and fixing the pivotal position of said guide lever attached to said lateral spray beam, whereby the pivotal position determines the distance of said spray nozzles supported on said lateral spray beam from said path, wherein said pivot bolts attached to said guide levers attached to said lateral spray beam are positioned on said strand guide support at an angle relative to the strand surface whereby said guide levers of said at least one lateral spray beam pivot around said pivot bolts in a plane forming an acute angle with the plane defined by the nozzles supported by said lateral spray beam, and said adjusting means displaces said at least one lateral spray beam transversely to and longitudinally along said path.

4,476,915

METHOD FOR REGULATING INDIVIDUAL DRIVES OF AN ARCUATELY SHAPED MULTI-ROLLER CONTINUOUS STRAND CASTING MACHINE FOR METAL, PARTICULARLY STEEL

Werner Rahmfeld, Stockweg 32, D-4330 Mülheim; Achim Kuhon, Am Lerchenfeld 6, D-4133 Neukirchen-Vluyn, and Dieter Stalleicken, Bremweg 56, D-4100 Duisburg 46, all of Fed. Rep. of Germany

Filed Mar. 20, 1981, Ser. No. 246,056
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011137
Int. Cl.³ B22D *11/16*
U.S. Cl. 164—484 **4 Claims**



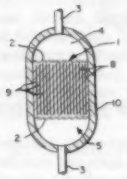
1. A method for continuous metallic casting comprising the steps of:
(a) separating a starter strand from a cast metallic strand;
(b) continuous casting a metal strand at a speed greater than 0.8 m/min;
(c) passing said cast metallic strand through a strand guide, said strand guide having an upstream arcuate section and a downstream linear section separated thereby by a bending point, both of said sections having pairs of supporting rollers;
(d) driving the pairs of supporting rollers in said arcuate section;
(e) producing compressive forces to act upon said cast metallic strand by using the torque of the pairs of supporting rollers in said linear section to brake the forces created by said driving pairs of supporting rollers in said arcuate section;
(f) said compressive forces reaching a maximum at said bending point; and
(g) the number of pairs of driving rollers in said arcuate section being at least twice the number of pairs of driving rollers in said linear section.

4,476,916

METHOD OF CASTING METAL MATRIX COMPOSITE IN CERAMIC SHELL MOLD

Henry J. Nusbaum, 109 Dickinson La., Wilmington, Del. 19807

Filed Jul. 27, 1981, Ser. No. 287,091
Int. Cl.³ B22C *1/02*; B22D *19/14*
U.S. Cl. 164—519 **5 Claims**



1. A method for making an investment cast, fiber reinforced metal matrix composite in a ceramic mold comprising forming a pattern of the composite, said pattern comprising a fiber array impregnated with a fugitive material and provided with conduits at locations to permit mold evacuation and mold filling, coating the pattern with a ceramic material that is not readily wetted by the metal to be cast when the metal is in the molten state, applying a plurality of additional coatings of a slurry of ceramic particles to the pattern to form a ceramic mold around the pattern, each of said coatings being dried after application, applying a coating of a ceramic sealant, forming a cavity within the mold by treating the pattern to remove the fugitive material, said fiber array remaining substantially in place within the mold cavity, firing the ceramic sealant, heating the mold to a temperature above the melting point of the matrix metal, introducing molten metal through a conduit into the mold cavity while applying a vacuum to the mold cavity through another conduit, infiltrating the fiber array with the molten metal, cooling the ceramic mold and removing it from the cast composite.

4,476,917

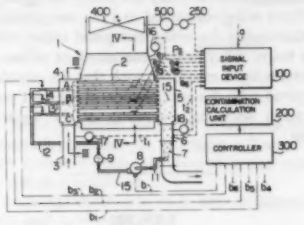
METHOD OF AND SYSTEM FOR CLEANING COOLING TUBES OF HEAT TRANSFER UNITS

Katsumoto Otake, Hitachi; Masahiko Miyai, Mito; Takuya Sasaki, Hitachi; Yasuteru Mukai, Hitachi; Sankichi Takahashi, Hitachi, and Isao Okouchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 30, 1981, Ser. No. 279,070
Claims priority, application Japan, Jun. 30, 1980, 55-89708
Int. Cl.³ F28G *13/00*
U.S. Cl. 165—1 **10 Claims**

1. In a method of cleaning cooling tubes of a heat transfer

unit having a steam chamber through which said cooling tubes extend and into which steam generated in a steam power generating plant is introduced under a steam pressure so as to exchange heat with a cooling water flowing through said cooling pipes, an inlet means for distributing the cooling water having an inlet temperature to one end of said cooling tubes and an outlet means for collecting the cooling water having an outlet temperature from the other end of said cooling tubes, the method comprising the steps of measuring heat flux which is transferred through walls of said tubes at selected ones of said cooling tubes, obtaining data of said steam pressure, said inlet temperature and said outlet temperature, finding a cleanliness of said cooling tubes by calculating said data, introducing cleaning bodies into the cooling water through said inlet means



so as to distribute the cleaning bodies to the cooling tubes to clean the latter, and collecting the cleaning bodies from the cooling water through said outlet means, the improvement comprising dividing said cooling tubes into a plurality of groups, each of said groups including a plurality of said cooling tubes having the same trends of cleanliness, said step of selecting include selecting one cooling tube from each of said groups and said step of introducing includes respectively introducing said cooling bodies into the cooling tubes of said groups with respective quantities of the cleaning bodies being suitable for cleaning the cooling tubes of each of said groups in dependence upon a particular degree of cleanliness of said cooling tubes of each of said groups, whereby larger quantities of said cleaning bodies are selectively fed to said groups of cooling tubes having a relatively low cleanliness.

4,476,918

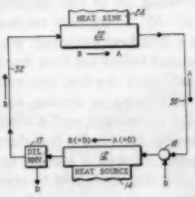
METHOD AND APPARATUS FOR A TEMPERATURE-SHIFTED CHEMICAL HEAT PIPE

Arthur S. Kesten, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 28, 1982, Ser. No. 392,441

Int. Cl.³ F28D *15/00*

U.S. Cl. 165—1 **22 Claims**



1. In a chemical heat pipe employing reversible endothermic/exothermic chemical reactions to transfer heat between a heat source at one temperature and a heat sink at a lower temperature and including a conduit in heat transfer relation with a heat source and a heat sink at respective heat source and heat sink positions along the conduit and a chemical reactant being endothermically reacted in said conduit at said heat source position to create a gaseous reaction product, said heat source reaction product being caused to flow through said conduit to said heat sink position where it is exothermically reacted to release heat, said endothermically and exothermically reacting system having particular reaction equilibria at temperature and pressure levels associated with the respective said heat source and heat sink positions, the method of shifting the equilibrium at one of said positions to allow reaction to occur at a different heat source or heat sink temperature while maintaining substantially the same said pressure levels, comprising the steps of:

introducing a diluent to the conduit such that it exists in the gaseous state at a predetermined one of the heat source and heat sink positions during the respective reaction occurring thereat; and

removing a substantial portion of the diluent from the reactant or reaction product downstream of said predetermined one of the heat source and heat sink positions, said diluent addition and removal being such as to maintain the pressure at said predetermined one of the heat source and heat sink positions substantially constant, whereby the excess moles introduced by the diluent shifts the equilibrium in a predetermined direction at said predetermined one of said heat source and and heat sink positions in order to allow reaction to occur at a respective different heat source or heat sink temperature.

14. In a chemical heat pipe employing reversible endothermic/exothermic chemical reactions to transfer heat between a heat source at one temperature and a heat sink at a lower temperature, said heat pipe including a conduit in heat transfer relation with a heat source and a heat sink at respective heat source and heat sink positions along the conduit, a chemical reactant being endothermically reacted in said conduit at said heat source position to create a gaseous reaction product, said reaction product being caused to flow through said conduit to said heat sink position and being exothermically reacted thereat to release heat, said endothermically and exothermically reacting system having particular reaction equilibria at temperature and pessure levels associated with the respective said heat source an heat sink positions, the improvement comprising:

means for shifting the equilibrium at one of said positions to allow reaction to occur at a different heat source or heat sink temperature while maintaining substantially the same pressure levels, said equilibrium shifting means including means for introducing a diluent to the conduit such that said diluent exists in the gaseous state at a predetermined one of the heat source and heat sink positions during the respective reaction occurring thereat, whereby the excess moles introduced by the diluent shifts the reaction equilibrium in a predetermined direction at said predetermined one of the heat source and heat sink positions.

4,476,919

AIR CONDITIONING APPARATUS FOR AUTOMOBILES

Ryosaku Akimoto; Yukio Yoshida, and Nobuaki Ito, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Churyo Engineering Co., Ltd., Nagoya, both of, Japan

Filed Dec. 2, 1981, Ser. No. 327,168

Claims priority, application Japan, Dec. 12, 1980, 55-178385[U]

Int. Cl.³ F25B *29/00*

U.S. Cl. 165—28 **5 Claims**

1. An air conditioning apparatus for an automobile having a compartment, comprising:

means forming an air flow path opening into said compartment and having an upstream end and a downstream end;

an air cooling unit including a compressor and an evaporator with said evaporator located in the air path adjacent the upstream end of said air flow path for supplying cooled air;

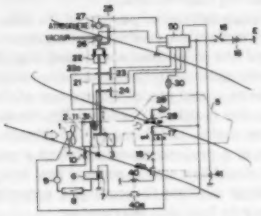
a heater located within said air flow path downstream from

said evaporator for heating a portion of the cooled air from said air cooling unit;

an air mixing damper in said air flow path located between said evaporator and said heater for selectively bypassing a portion of the cooled air from said evaporator over said heater and then introducing the mixture of the cooled air and bypassed heated air into the compartment of the automobile;

first means for sensing the temperature outside the compartment of the automobile and second means for sensing the temperature inside the compartment;

means forming a control device for controlling said air mixing damper based on temperatures sensed by said first



and second means inside and outside of the compartment to keep the inside temperature of the compartment at a constant temperature;

means for actuating said air mixing damper;

a variable resistor connected operatively to said air mixing damper; and

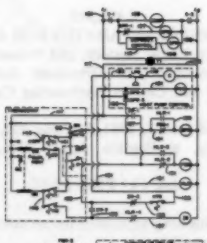
a temperature detector for detecting the temperature of said evaporator or the temperature of the cooled air supplied therefrom and having an electrical resistance, said means forming the control device being responsive to the voltage across said variable resistor and said temperature detector in series for controlling said compressor based on a signal proportional to the series resistance of said variable resistor and to the resistance of said temperature detector.

4,476,920

METHOD AND APPARATUS FOR INTEGRATING OPERATION OF A HEAT PUMP AND A SEPARATE HEATING SOURCE

Alan S. Drucker, Dewitt; Richard D. D'Aversa, Liverpool, and Richard D. Jeffers, N. Syracuse, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 2, 1982, Ser. No. 394,578
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—29 **9 Claims**



1. A control circuit for integrating and separating the operation of a heat pump including heating and defrost modes of operation and a separate heating means, the separate heating means including a circulator for circulating a heating fluid, the control circuit including a thermostat for sensing heating and cooling needs and an outdoor thermostat for selecting either the heat pump or the separate heating means for supplying heat energy to a space to be conditioned which comprises:

a heating lockout relay connected to the control circuit to be energized when the thermostat senses a cooling need or when the unit is operated in the defrost mode of operation, said heating lockout relay preventing operation of the separate heating means when the heat pump is operating in the heating mode of operation;

a furnace boiler relay connected to be energized in response to the thermostat sensing a first stage heating need and the outdoor thermostat selecting furnace boiler operation and the heating lockout relay not being energized; and

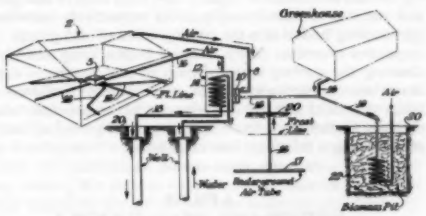
a circulator relay connected to a fan energization switch of the thermostat for being energized either when the furnace boiler relay is not energized or when the heating lockout relay is energized such that the circulator relay is energized with the energization of the heat pump and not energized with the operation of the separate heating means.

4,476,921

INSULATING AIR SHEATH FOR BUILDINGS AND THE LIKE

Louis Stubbolo, Wyoming, Del., assignor to Aire-Wrap, Inc., Del.

Filed Mar. 29, 1982, Ser. No. 363,142
Int. Cl.³ F24H *7/00*
U.S. Cl. 165—48 R **12 Claims**



1. The method of insulating a building structure comprising:

(a) obtaining low grade heat from air or water below the hard frost line at the location of said building, said low grade heat being in the temperature range of approximately 45°–65° F.,

(b) heating or cooling air to the temperature range of approximately 45°–65° F. by heat exchange with said low grade heat in a first heat exchange wherein a liquid that has been circulated below the frost line to collect said low grade heat is delivered to a first heat exchanger to provide a first source of heating or cooling to the air circulating within said heat exchanger, and a second heat exchange wherein sid low grade heat is transferred to ambient air that is circulated through a second heat exchanger and said ambient air is then delivered by conduit means to said first heat exchanger, thereby providing a second source of said low grade heat to the air within said first heat exchanger, and

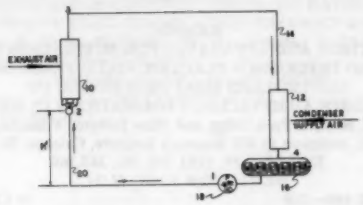
(c) circulating said heated or cooled air below and adjacent the floor of said building, above and adjacent the ceiling of said building, and within said channels in the walls of said building, thereby providing an insulating sheath of air substantially surrounding but not entering the useable space within said building.

4,476,922

FORCED BILATERAL THERMOSIPHON LOOP

Glenn M. Heilig, Jr., and Joseph M. Gamewell, both of P.O. Box 2309, Salisbury, N.C. 28144

Filed Oct. 26, 1981, Ser. No. 314,628
Int. Cl.³ F28D *15/00*
U.S. Cl. 165—104.25 6 Claims



1. A heat exchange system for use in connection with an air treatment system for commercial buildings and work environments, which system includes an incoming and exhaust airstream; said system comprising:

(a) a heat exchange means placed in heat exchange relationship with each airstream;

(b) a supply conduit and a return conduit connecting each of said heat exchange means;

(c) a two-phase working fluid so selected as to change phase at temperatures below that of the warmer of said airstreams and above that of the cooler of said airstream;

(d) a pump means in one of said conduits for pumping condensed refrigerant from the heat exchanger in the cooler of said airstream to the heat exchanger in the other airstream;

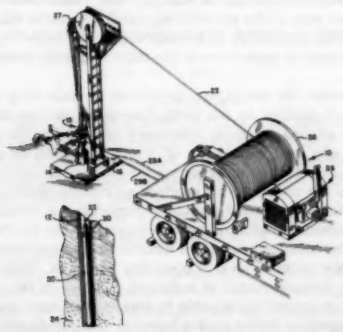
(e) whereby heat is removed from the warmer of said airstreams, regardless of whether the two airstreams are adjacent each other or separated by considerable distance, and regardless of whether there is a difference in elevation between said airstreams.

4,476,923

FLEXIBLE TUBING PRODUCTION SYSTEM FOR WELL INSTALLATION

John B. Walling, 5613 Trail Lake Dr., Fort Worth, Tex. 76133

Continuation-in-part of Ser. No. 170,610, Jul. 21, 1980, Pat. No. 4,336,415. This application Mar. 18, 1982, Ser. No. 359,477
Int. Cl.³ E21B *43/00*
U.S. Cl. 166—65 R 1 Claim



1. A pumping system for producing formation fluid from a well comprising, in combination:

a submersible pump having a power fluid reservoir, a housing enclosing a hydraulic power cylinder and a production cylinder;

a hydraulic power pump mounted in said housing having an inlet port in communication with the power fluid reservoir and a discharge port;

a shuttle valve having an inlet port connected to the pump discharge port and an outlet port connected in fluid communication with said power cylinder for alternately pressurizing and relieving the power cylinder, said shuttle valve having a return circulation port in communication with said reservoir for conveying power fluid out of the power cylinder as it is relieved;

an electric motor disposed for heat exchange with power fluid circulated through said reservoir and mechanically coupled to said hydraulic power pump for driving said power pump in response to electrical power conducted downhole from a surface facility;

a length of flexible, composite production tubing extendable into the well and which can be wound and unwound from a reel, said composite production tubing including a tension load bearing component for supporting said pump in the well, a production conduit component coupled to said production cylinder for conveying formation fluid produced by said pump, an electrical power transfer component coupled to said motor for supplying operating power from an external power source to said motor, and a hydraulic supply conduit and a hydraulic return conduit coupled to the power fluid reservoir for conveying hydraulic power fluid to and from a surface facility; and,

a surface facility including a pump and a heat exchanger connected in series fluid circuit relation with said supply and return conduits for circulating hydraulic power fluid through said power fluid reservoir and for transferring heat from said electric motor, respectively.

4,476,924

GREASE INJECTION CONTROL HEAD HAVING A SPECIFIC GAS TRAP

Carl E. Winders, Lafayette, La., and Fred E. Watkins, Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Mar. 7, 1983, Ser. No. 472,827
Int. Cl.³ E21B *33/08*
U.S. Cl. 166—84 9 Claims

1. A gas trap for use with a wireline extending into a well for trapping gas rising in the well comprising,

an outer body having an upper end and a lower end and adapted to be inserted into a well with the upper end adapted to be placed in communication with a grease lubricator and the lower end adapted to be exposed to fluids in the well,

an inner housing having a longitudinally extending bore for

accommodating a wireline and positioned in the body, the exterior of the housing spaced from the interior of the body forming a space therebetween, and

at least one passageway extending upwardly from the bore through the housing to the space for diverting rising gas from the bore,

said housing including means forming an internal chamber surrounding but spaced from the bore, and

at least one opening extending upwardly from the bore to the chamber for diverting rising gas from the bore into the chamber,

a passageway from the chamber to the space for transmitting gas from the chamber to the space.

4,476,925

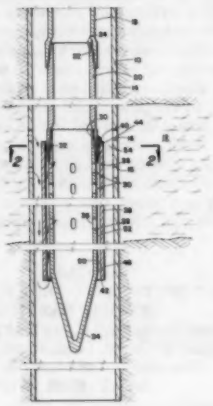
SAND SHIELD FOR BOTTOM HOLE PUMPS

Pope D. Cox, P.O. Box 1182, Drumright, Okla. 74030

Continuation-in-part of Ser. No. 422,706, Sep. 24, 1982, abandoned. This application Apr. 25, 1983, Ser. No. 488,207

Int. Cl.³ E21B *43/00*

U.S. Cl. 166—105.1 **1 Claim**



1. For use on the lower end of a string of tubing suspended in a casing in a borehole in an oil well, an improved apparatus for reducing the entrance of sand into a bottom hole pump, comprising:

a seating nipple secured at its upper end to the lower end of a string of tubing, the seating nipple having an interior configuration to receive and support a sucker rod actuated bottom hole pump therein, the seating nipple having internal threads at the lower end thereof;

a mud anchor having external threads on the upper end thereof threadably engaging said seating nipple lower internal threads whereby the mud anchor is secured to the lower end of said seating nipple and extends coaxially downwardly therefrom, the mud anchor being tubular and of internal diameter greater than the external diameter of a bottom hole pump to be received and supported in said seating nipple, the mud anchor having perforations therein through which fluid flows;

spacers affixed in spaced apart relationship to the external surface of the lower end of said seating nipple;

a tubular sand shield secured at its inner periphery of its upper end to said spacers affixed to the lower end of said seating nipple whereby the sand shield extends coaxially downwardly from said seating nipple, the sand shield coaxially receiving said mud anchor therein and having an internal diameter greater than the external diameter of said mud anchor providing a vertical annular area therebetween, the vertical annular area having an upper portion, the lower end of the sand shield being below the lowest perforations in said mud anchor whereby fluid from the well borehole must flow upwardly in said annular area to enter into said mud anchor and thence into a pump operated within the mud anchor, the upper end of said annular area being open between said spacers providing communication between the upper portion of said annular area with the interior of said casing for the passage of gas directly upwardly therethrough.

4,476,926

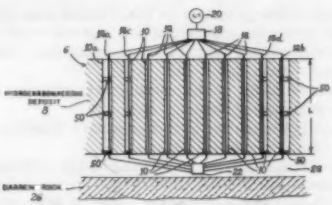
METHOD AND APPARATUS FOR MITIGATION OF RADIO FREQUENCY ELECTRIC FIELD PEAKING IN CONTROLLED HEAT PROCESSING OF HYDROCARBONACEOUS FORMATIONS IN SITU

Jack E. Bridges, Park Ridge, and Allen Taflove, Wilmette, both of Ill., assignors to IIT Research Institute, Chicago, Ill.

Filed Mar. 31, 1982, Ser. No. 363,765

Int. Cl.³ E21B *36/04, 43/24*

U.S. Cl. 166—248 **51 Claims**



1. The method of mitigating the effects of radio frequency electric field peaking in the earth formations surrounding a conductor excited by radio frequency energy in the controlled in situ heat processing of hydrocarbonaceous earth formations, wherein radio frequency electromagnetic energy is supplied to said conductor to produce an electric field within the earth formations, said method comprising removing a portion of the earth formations to accommodate insertion of said conductor at a desired location in the earth formations and to provide a buffer region between said conductor and said surrounding earth formations; supporting said conductor at said desired location in spaced relationship to said surrounding earth formations, said buffer region encompassing all of the electric field enhancement region around said conductor where the probability of breakdown in said earth formations over the period of application of the radio frequency energy would be above a tolerable level; and filling said buffer region with dielectric material having an electric field breakdown level greater than that of the surrounding earth formation medium such that the probability of breakdown in the buffer region over the period of application of the radio frequency energy is tolerable.

26. Structure for mitigating the effects of radio frequency electric field peaking in the earth formations surrounding a conductor excited by radio frequency energy for the controlled in situ heat processing of hydrocarbonaceous earth formations, wherein radio frequency electromagnetic energy is supplied to the conductor to produce an electric field within the earth formations, said structure comprising a conductor having a minimum radius of curvature greater than the radius at which the enhancement of the electric field at said conductor exceeds a tolerable level at operating potentials; means for supporting said conductor at a desired location in the earth formations in spaced relationship to surrounding earth formations to provide a buffer region between said conductor and said surrounding earth formations, said buffer region encompassing all of the electric field enhancement region around said conductor where the probability of breakdown in said earth formations over the period of application of the radio fre-

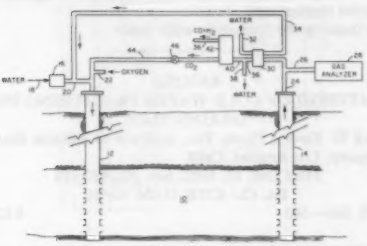
quency energy would be above a tolerable level; and dielectric material filling said buffer region, said dielectric material having an electric field breakdown level greater than that of the surrounding earth formation medium such that the probability of breakdown in the buffer region over the period of application of the radio frequency energy is tolerable.

4,476,927

METHOD FOR CONTROLLING H_2/CO RATIO OF IN-SITU COAL GASIFICATION PRODUCT GAS

James B. Riggs, Maidsville, W. Va., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 31, 1982, Ser. No. 364,148
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—261 **1 Claim**



1. A method for the in-situ recovery of a synthetic product gas from a subterranean coal deposit penetrated by at least one injection well and at least one spaced-apart production well, said well's being in fluid communication with a substantial portion of the coal deposit, comprising the steps of:

a. establishing fluid communication passages in the coal deposit between said injection well and said production well;

b. injecting oxygen and steam into said coal seam via said injection well to react with said coal and form a product gas containing carbon dioxide, hydrogen, and carbon monoxide;

c. producing said product gas through said production well;

d. analyzing said product gas to determine the ratio of H_2/CO;

e. separating carbon dioxide from said product gas;

f. mixing said carbon dioxide recovered from said product gas with the oxygen and steam injected into the coal deposit via said injection well;

g. controlling the amount of carbon dioxide injected into the coal deposit so that the oxidation reactions therein form a product gas having a predetermined H_2/CO ratio within the range of 1.5 to 4.0; and

h. recovering the product gas having a predetermined H_2/CO ratio.

4,476,928

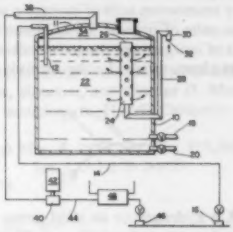
METHOD AND APPARATUS FOR SOLVENT GENERATION AND RECOVERY OF HYDROCARBONS

William G. Green, deceased, late of Port Charlotte, Fla. (by Melissa Jones, legal representative), assignor to Dimar Holding Corporation, Houston, Tex.

Filed Jul. 23, 1982, Ser. No. 401,312
Int. Cl.³ E21B *43/40*
U.S. Cl. 166—267 **10 Claims**

1. In a process for the extraction of a solvent from a liquid mixture of organic compound recovered from a subterranean deposit, the steps of retaining in a closed container a quantity of a liquid mixture or organic compounds recovered from a subterranean deposit, circulating ambient atmospheric air through the liquid mixture to vaporize solvent compounds therein, collecting the vaporized solvent compounds in a chamber with the closed container, drawing off from the chamber the vaporized solvent compounds which are adapted for injection into a subterranean deposit to recover liquid and solid hydrocarbons, injecting the recovered solvent compounds into a subterranean deposit to recover liquid hydrocarbons, and conducting the liquid mixture recovered by the solvent to the closed container.

4. In an apparatus for the generation of a solvent from a liquid mixture of organic compounds recovered from a subterranean deposit, a closed container for retaining a quantity of a liquid mixture of organic compounds and having inlet and



outlet means for the liquid mixture, there being a chamber defined in said closed container above the liquid mixture contained therein, a first passage communicating with said chamber through which solvent vapor collected in said chamber can be drawn off, and means connected to a source of ambient atmospheric air for circulating ambient atmospheric air within the liquid mixture in said closed container, said circulating means comprises a vertically disposed perforated pipe within said closed container, said pipe having a closed upper end and a lower end connected to the source of ambient atmospheric air.

4,476,929

SULFOXIDE COSURFACTANTS IN ENHANCED OIL RECOVERY PROCESSES

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 29, 1982, Ser. No. 427,251
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—273 **8 Claims**

5. A process for hydrocarbon recovery from a subterranean formation comprising:

(a) injecting a surfactant system comprising a hydrocarbon sulfonate surfactant and a dimethylsulfoxide cosurfactant and wherein said surfactant is present in an amount of from about 0.10 to about 15 parts by weight and said cosurfactant is present in an amount from about 0.15–15 parts by weight into said formation via at least one injection well thereby causing the so-injected system to move from the injection well towards one or more production wells thereby displacing the hydrocarbon present in said subterranean formation, and

(b) thereafter recovering the displaced hydrocarbon from said subterranean formation.

4,476,930

INHIBITION OF SCALE DEPOSITION FROM STEAM GENERATION FLUIDS

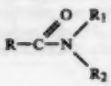
David J. Watanabe, Orange, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 23, 1982, Ser. No. 410,318
Int. Cl.³ E21B *37/00, 43/12*
U.S. Cl. 166—279 **32 Claims**

1. A method for treating a fluid stream passing through a conduit, which fluid stream contains liquid hot water and which water contains dissolved salts, to inhibit formation of

scale in the conduit and/or to dissolve scale previously formed, comprising:

(a) mixing with said fluid stream a treating agent comprising a water-soluble compound, which provides a nitrogen-containing cation capable of flashing to become a gas at high temperatures, selected from the group consisting of ammonium halides, ammonium salts of inorganic acids, ammonium salts of organic acids selected from the group consisting of mono-, di-, and tri-chloracetic acids, formic acid, acetic acid, citric acid, tartaric acid, gallic acid, glyoxylic acid, and benzoic acid, ammonium salts of alpha hydroxy organic acids, quaternary ammonium halides, quaternary ammonium salts of inorganic acids, quaternary ammonium salts of organic acids, amine hydrochlorides, amine salts of inorganic acids, amine salts of organic acids, and amides characterized by the formula:

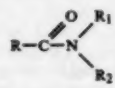


wherein R is hydrogen or an alkyl group containing 1 to about 8 carbon atoms, and R_1 and R_2 are the same or different alkyl groups containing 1 to about 8 carbon atoms; and

(b) flashing at least a portion of the liquid hot water to steam.

22. A method for treating a well penetrating a reservoir producing a fluid stream containing liquid hot water, which water contains dissolved salts, to inhibit formation of a scale in the reservoir in the immediate vicinity of the well, in the well itself, and in the fluid handling equipment associated with the well contacted by the fluid stream, and/or to dissolve scale previously formed, comprising:

(a) mixing with the fluid stream a treating agent comprising a water-soluble compound, which provides a nitrogen-containing cation capable of flashing to become a gas at high temperatures, selected from the group consisting of ammonium halides, ammonium salts of inorganic acids, ammonium salts of organic acids selected from the group consisting of mono-, di-, and tri-chloracetic acids, formic acid, acetic acid, citric acid, tartaric acid, gallic acid, glyoxylic acid, and benzoic acid, ammonium salts of alpha hydroxy organic acids, quaternary ammonium halides, quaternary ammonium salts of inorganic acids, quaternary ammonium salts of organic acids, amine hydrochlorides, amine salts of inorganic acids, amine salts of organic acids, and amides characterized by the formula:



wherein R is hydrogen or an alkyl group containing 1 to about 8 carbon atoms, and R_1 and R_2 are the same or different alkyl groups containing 1 to about 8 carbon atoms; and

(b) producing the well under conditions at which at least a portion of the liquid hot water flashes to steam.

4,476,931

WATER CONTROL WELL TREATING SOLUTION AND METHOD

Joel L. Boles, Forney, and Gene Mancillas, Arlington, both of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Sep. 17, 1982, Ser. No. 419,294
Int. Cl.³ E21B *33/138*
U.S. Cl. 166—294 **10 Claims**

1. A method of treating an oil well formation to lower the relative permeability of the formation being treated to water, comprising the steps of:

preflushing the formation with oil containing a surface active agent;

injecting a treating solution immediately after the preflush, said treating solution comprising an amphoteric polymeric material, a mutual solvent, a surface active agent, and a liquid carrier; and

overflushing the formation with water.

6. A method of treating a gas well formation to lower the relative permeability of the formation being treated to water, comprising the steps of:

preflushing the formation with water containing a surface active agent;

injecting a treating solution immediately after the preflush, said treating solution comprising an amphoteric polymeric material, a mutual solvent, a surface active agent, and a liquid carrier; and

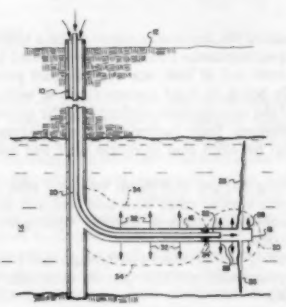
overflushing the formation with water.

4,476,932

METHOD OF COLD WATER FRACTURING IN DRAINHOLES

Leonard W. Emery, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 12, 1982, Ser. No. 433,921
Int. Cl.³ E21B *43/24, 43/26*
U.S. Cl. 166—303 **4 Claims**



1. In a lateral borehole extending from a vertical borehole, a method for selectively forming a fracture substantially displaced from said vertical borehole comprising:

injecting a cooling fluid into the formation surrounding a selected portion of said lateral borehole substantially displaced from said vertical borehole;

injecting a warming fluid into the formation surrounding the unselected portions of said lateral borehole; and

injecting a fracturing fluid into said lateral borehole at a pressure sufficient to initiate a fracture in said selected portion but not in the remaining portions of said borehole.

4,476,933

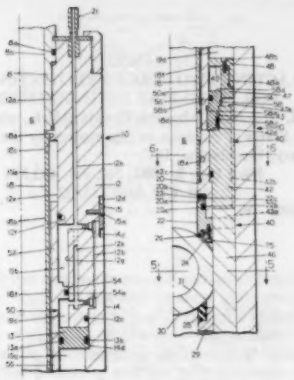
LUBRICATOR VALVE APPARATUS

Robert T. Brooks, Aberdeen, Scotland, assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Apr. 11, 1983, Ser. No. 484,090
Int. Cl.³ E21B *34/10*
U.S. Cl. 166—324 **18 Claims**

1. An apparatus for installation of drilling, completion, workover tools, or parts thereof for subsequent use in an oil or gas well and for control of fluids through a conduit defined by said apparatus, comprising: valve means for control of fluid transmission through said conduit; a reciprocably shiftable actuator for said valve means, said actuator being shiftable in one direction to open said valve means and in the opposite

direction to close said valve means; fluid pressure activatable means mounted for reciprocable movement adjacent said reciprocably shiftable actuator; means defining a lost motion connection between said fluid pressure activatable means and said reciprocably shiftable actuator; a first piston surface on said fluid pressure activatable means movable in a first chamber and responsive to a first applied control pressure to shift



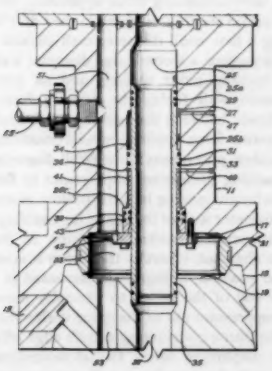
said fluid pressure activatable means in a valve opening direction; a second piston surface on said fluid pressure activatable means movable in a second chamber and responsive to a second applied control pressure to shift said fluid pressure activatable means in a valve closing direction; and means responsive to the initial movement of said fluid pressure activatable means in said valve opening direction for opening a fluid passage around said valve means.

4,476,934

RETRACTABLE STINGER PURGE VALVE

Albert M. Regan, Huntington Beach, Calif., assignor to Hughes Tool Company, Houston, Tex.

Filed Aug. 30, 1983, Ser. No. 527,927
Int. Cl.³ E21B *34/04*
U.S. Cl. 166—368 **3 Claims**



1. In a subsea well assembly having a riser connector and means for mounting the connector to a Christmas tree, both of which have bores coaxial with each other, the upper end of the Christmas tree bore being separated from the lower end of the connector bore by a chamber, the connector having an annulus passage that also communicates with the chamber, the improvement comprising:

a stinger having a tubular body with an upper end adapted to engage the connector bore in sliding sealing contact, and a lower end adapted to engage the Christmas tree bore in sliding sealing contact; and

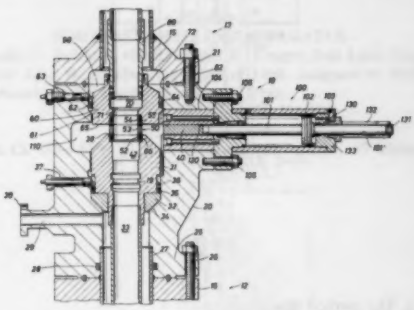
means for axially moving the stinger with respect to the connector and the Christmas tree between a flow-through position in which each end engages its respective bore, to a purge position in which one of the ends is withdrawn from its respective bore to allow fluid to be pumped through the annulus passage, chamber and connector bore.

4,476,935

SAFETY VALVE APPARATUS AND METHOD

Joseph H. Hynes, Houston, and Charles D. Morrill, Humble, both of Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Mar. 9, 1983, Ser. No. 473,564
Int. Cl.³ E21B *29/00*
U.S. Cl. 166—373 **37 Claims**



10. A safety valve for controlling the flow in a flow line comprising,

a punch out tube separate of said flow line,

means for securing said punch out tube in series with the flow line, and

ram means for ramming the punch out tube, displacing at least a portion of the punch out tube from the flow path of the flow line, and sealing the flow line.

14. A punch out tube adapted for placement in series with a flow line comprising,

a bottom cylindrical member having a groove provided in its top end surface and extending around the circumference of the top end surface,

a top cylindrical member having a groove provided in its bottom end surface and extending around the circumference of its bottom surface,

a middle cylindrical member having a groove provided in its bottom end surface and a groove provided in its top end surface, said grooves in the bottom end surface and top end surface extending around the circumference of the top and bottom end surfaces,

said top, bottom, and middle cylindrical members being stacked whereby the bottom end surface of the middle cylindrical member abuts the top end surface of the bottom cylindrical member and the bottom end surface of the top cylindrical member abuts the top end surface of the middle cylindrical member and the grooves in the abutting surfaces cooperate to form a circumferential channel in the abutting middle and top members and in the abutting bottom and middle members, and

means disposed in the resulting channels between the bottom and middle members and between the middle and top

members for sealing the members against flow through the tube resulting from the stacked members,

whereby when the top and bottom members are fixed and the middle member is rammed from its side, the middle member is separated from the bottom and top members.

4,476,936

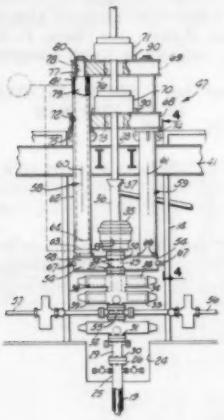
JACKING MECHANISM SUPPORTED BY A WELLHEAD

George I. Boyadjieff, Anaheim, and Andrew B. Campbell, San Marino, both of Calif., assignors to Varco International, Inc., Orange, Calif.

Continuation of Ser. No. 333,031, Dec. 21, 1981, abandoned. This application Sep. 15, 1983, Ser. No. 532,802

Int. Cl.[3] E21B *19/06*

U.S. Cl. 166—383 6 Claims



1. The method that comprises:

drilling a well utilizing a rig having a mast projecting upwardly above the well in a predetermined drilling position, and having a rig floor and a rotary table, and utilizing a drill string suspended by said mast and turned by said rotary table and extending downwardly along a predetermined axis relative to said mast and through said rig floor and into the well;

removing said drill string from the rig after completion of the drilling operation;

positioning in the well after at least a portion of the drilling operation has been completed a first length of casing of a relatively large diameter having a tubular wellhead structure connected thereto and spaced beneath the rig floor;

lowering through said wellhead structure and through said first length of casing while said mast remains in said drilling position above the well, a string of smaller diameter casing which, during at least a portion of the lowering operation, has a weight greater than the load supporting capacity of said mast used in drilling;

effecting the downward movement of said string of smaller diameter casing, during at least said portion of the lowering operation when the weight of said casing string exceeds the capacity of the mast, by actuating a first casing supporting unit of a jacking mechanism which is accessible from above the rig floor upwardly and downwardly relative to a second casing supporting unit of the jacking mechanism which is accessible from above the rig floor by means of a plurality of fluid pressure operated piston and cylinder mechanisms projecting downwardly beneath the level of the rig floor, with the casing string being supported alternately by the two units respectively; and

transmitting load forces resulting from the weight of said casing string from each of said supporting units downwardly beneath the level of said rig floor and to said tubular wellhead structure at a location spaced beneath the rig floor and then at least in part through said wellhead structure to the earth, without transmission of said forces through said mast, but while said mast used in driling remains in said drilling position above the well;

said method including supporting said rotary table from said wellhead structure through said piston and cylinder mechanisms during drilling of the well.

4,476,937

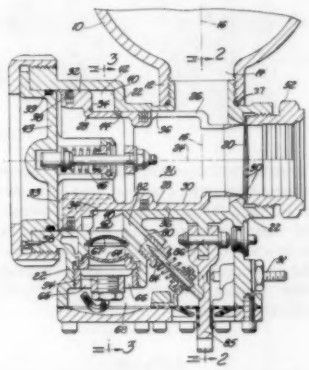
RAPID ACTING TWO STAGE PYROTECHNIC VALVE FOR FIXED FIRE EXTINGUISHERS

Edward J. Rozniecki, Macomb County, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 8, 1982, Ser. No. 433,571

Int. Cl.[3] A62C *35/02*

U.S. Cl. 169—26 10 Claims

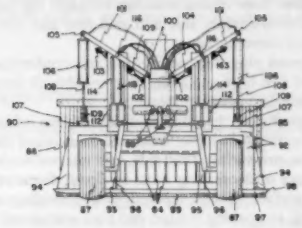


1. In a fire suppressant system comprising a pressurized suppressant container having a discharge opening; a control valve housing located in close adjacency to the container, said housing defining a first relatively small diameter internal guide surface, a second relatively large diameter internal guide surface, and an interconnecting force-application surface; a hollow stepped piston slidably mounted in the valve housing, said piston having a first small diameter wall slidable on the first housing guide surface, a second large diameter wall slidable on the second housing guide surface, and an interconnecting force-application wall facing the housing force-application surface; the space between the housing force-application surface and the piston force-application wall constituting an annular force chamber; port means in the small diameter wall of the piston for enabling pressurized suppressant to flow from the container discharge opening into the hollow piston; an orifice in the small diameter wall of the piston for enabling some of the pressurized suppressant within the piston to flow into the annular force chamber, whereby the piston is normally biased to a retracted position; a diaphragm mounted in the housing adjacent one end of the piston to normally prevent flow of pressurized suppressant out of the space within the piston; said one end of the piston constituting a knife edge effective to cut through the diaphragm when the aforementioned annular force chamber is depressurized; and rapid-acting means for venting suppressant from the annular force chamber to depressurize same, thereby enabling suppressant within the hollow piston to move said piston from its retracted position to a flow-open position in which the knife edge has cut through the diaphragm.

4,476,938
AERATING MEANS

Leon A. McKay, 701 Fairfield Cir., Dunn, N.C. 28334

Continuation-in-part of Ser. No. 087,658, Oct. 24, 1979, abandoned. This application Aug. 9, 1982, Ser. No. 406,281
Int. Cl.³ A01B 45/02
U.S. Cl. 172—22 6 Claims



1. An improved aerating means comprising: a support vehicle; an open, hollow, box-like presser skirt reciprocably mounted on said support vehicle and having a ground engaging presser foot mounted on the lower edge thereof and extending about its periphery; a compressable presser pad mounted on the bottom of said peripheral presser foot and extending downwardly therefrom; a carriage reciprocably mounted within said open, hollow box-like presser skirt and interiorly of said peripheral presser foot and its associated peripheral presser pad; a multiplicity of drill means rotatively mounted on said carriage means interiorly of said presser skirt and its associated peripheral presser foot and presser pad; means for reciprocating said presser skirt up and down relative to the earth; means for reciprocating said carriage means up and down relative to said presser skirt; and means for rotatively driving said drill means mounted on said carriage interiorly of said presser skirt and its associated peripheral presser foot and presser pad whereby a highly efficient aerating means is provided.

4,476,939
MULTI-FUNCTIONAL GARDEN TOOL

Gary E. Wallace, Rte. 5, #25 Lazy S La., Chico, Calif. 95926

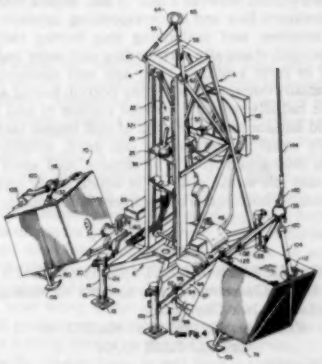
Filed Jun. 20, 1983, Ser. No. 505,890
Int. Cl.³ A01B 1/20
U.S. Cl. 172—374 6 Claims

1. A multi-functional garden tool comprising:
a handle
a head portion having a blade with front and rear edges, and
a rake portion disposed adjacent the rear edge of the blade with its tynes generally normal to said blade, said blade being connected to said handle by,
connecting rods attached to said handle,
support means mounted on said connecting rods, for pivotally supporting additional garden implements, two pivotally mounted garden implements retained by said support means, one on each side of the handle, each said support means being attached to one of said connecting rods by a pivot pin, said pivot pin being horizontally disposed when said blade is vertically disposed, wherein said blade includes an inwardly concave rear surface, said blade having a pair of inwardly disposed notches on opposite sides of said blade, proximate the front edge, each of said notches being so spaced from said pivot pin and wherein said support means and said implements are so sized that when said implements are folded against said blade, a portion of each of said implements fits into one of said notches so that said notches provide for implement stowage.

4,476,940
PORTABLE DRILLING APPARATUS

Ronald F. Reichert, Orem; Steven K. Kruger, Salt Lake City, and John W. Rhodes, Provo, all of Utah, assignors to PDR Manufacturing Corporation, Orem, Utah

Filed Apr. 26, 1982, Ser. No. 371,592
Int. Cl.³ E21B 7/12
U.S. Cl. 173—37 17 Claims



1. A portable drilling apparatus comprising
a center generally vertically-oriented drilling tower for carrying a drill assembly,
a first module mounted on and demountable from one side of the drilling tower and including a first power means for supplying power to operate the drill assembly,
a second module mountable on and demountable from the other side of the drilling tower and including a second power means for supplying power to assist in the operation of the drill assembly, and
one or more hydraulic motors mounted on the drilling tower and a compressor also mounted on the drilling tower and driven by one of the hydraulic motors, said hydraulic motors and compressor being coupled to the drill assembly to operate the assembly, and wherein said first power means comprises an engine, and a hydraulic pump driven by the engine and coupled to the hydraulic motors, and wherein said second power means comprises a second engine and a second hydraulic pump driven by the second engine and coupled to the hydraulic motors.

4,476,941

MOTOR-DRIVEN HAND-HELD PERCUSSION TOOL

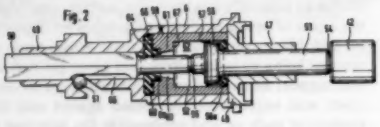
Manfred Buck, Nürtingen; Frank Müller, Leinfelden-Echterdingen II, and Karl Wanner, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,993

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1982, 3224176

Int. Cl.³ B25D *17/00*

U.S. Cl. 173—117 8 Claims



1. A motor-driven hand-held percussion tool comprising a housing forming at one end a tool receiver having an axis; a tool axially guided in the tool receiver and having an inner end; a percussion piston coaxial with said axis spaced from said inner end and axially reciprocatable in said housing; motor driven air cushion striking means cooperating with said percussion piston for reciprocating the latter; an elongated anvil reciprocatably guided between said inner end of said tool and said percussion piston and movable to an idle stroke position; an impact body guided in longitudinal direction of said elongated anvil and having an abutment face impingeable by said anvil, said housing having rearwardly of said tool receiver, a portion guiding said impact body; and a rubber-elastic cushioning ring sandwiched between a face of said impact body opposite said abutment face and a corresponding opposite face of said tool receiver, said cushioning ring having radially inwardly a portion elastically surrounding said inner end of said tool so as to form a sealing ring, and said cushioning ring having a radially outwardly extending portion having a peripheral surface radially spaced from said portion of said housing guiding said impace body, the mass of said impact body being substantially equal to the mass of said anvil, whereby when said tool is disengaged from a workpiece, said anvil will be moved to said idle stroke position in which a rear end of said anvil will not be contracted by said percussion piston.

4,476,942

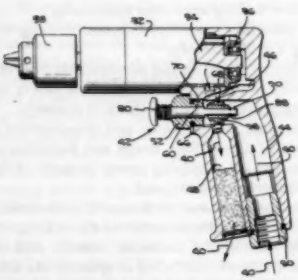
VARIABLE SPEED INLET CONTROL VALVE

Robert D. Elkin, Claremont, Calif., assignor to Monogram Industries, Inc., Culver City, Calif.

Filed Apr. 28, 1982, Ser. No. 372,742

Int. Cl.³ B23B *45/04*

U.S. Cl. 173—169 5 Claims



1. A variable speed inlet control valve for controlling the flow of fluid through a passgeway from a source under pressure, said valve comprising:

(a) a body member adapted to be sealably inserted into the passageway, said body member having first, second, and third bores therein, said first bore communicating with the passageway on the pressurized fluid side, said first bore having an internal surface of decreasing cross-sectional diameter from said pressurized fluid side to the non-pressurized fluid side of said valve, said second bore being a substantially cylindrical bore concentrically aligned with said first bore and communicating with the space outside of the passageway from which the valve is to be operated, said third bore communicating between the passageway on the downstream side and said first and second bores adjacent there junction;

(b) a tapered plug disposed within and conforming to said tapered first bore and adapted to sealably fit into said first bore in a first position therein;

said tapered plug having an outer surface of decreasing cross-sectional diameter from said pressurized fluid side to said non-pressurized fluid side, said internal surface of said first bore of decreasing cross-sectional diameter and said outer surface of said tapered plug providing means for creating an opening around said plug within said first bore of increasing volumetric capacity as said operating member is operated to move said plug out of mating engagement with said tapered bore thereby providing an increasing amount of fluid flow around said plug proportional to the amount of depression of said operating, the cross-section about the internal surface of said first bore and the cross-section through the outer wall of said plug when said first bore and said plug are in said one position being essentially coincident, said plug having a fourth bore therethrough which is cylindrical in shape and concentrically aligned with said first and second bores;

(c) an operating member disposed within said fourth and second bores, said member being adapted to be longitudinally depressed to operate the valve, said member comprising a first cylindrical portion adapted to sealably and slidably fit within said second bore and a second cylindrical portion adapted to slide with a clearance fit within said fourth bore, said operating member being slidably within said first, second, and fourth bores between closed, idling, and full-open positions, said operating member including means for fluid sealing the space between said second cylindrical portion and said fourth bore when said operating member is in said closed position, said operating member including means for contacting said plug upon reaching said idle position and for carrying said plug longitudinally out of said first bore from its first position therein in combination with said operating member as said operating member is moved between said idle position and said full open position whereby an opening of increasing volumetric capacity is created in the passageway as said operating member is moved from said idling position to said full-open position thereby providing an increasing amount of fluid flow around said plug proportional to the extent of movement of said operating member from its idle position; and,

(d) bias means operably disposed to urge said operating member towards said closed position.

4,476,943

DRILLING EQUIPMENT WITH ADAPTOR FOR STEERING LONG BOREHOLES

David R. Williams, Derby, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Dec. 29, 1981, Ser. No. 335,469

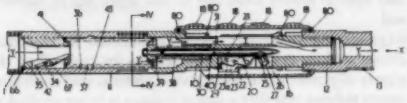
Claims priority, application United Kingdom, Jan. 23, 1981, 8102054

Int. Cl.³ E21B *7/08*

U.S. Cl. 175—61 11 Claims

1. Drilling equipment providing an adaptor for association with a rotary drilling bit mountable on a rotary drill rod for forming a borehole, the adaptor comprising a relatively inner rotary component drivably connectable to the drill rod and to

the drilling bit or drivably connectable to connector components enabling the rotary component to be drivably connectable to the drill rod and to the drilling bit, a relatively outer component arranged at least part way around the inner rotary component, releasable latch means comprising a pivotally mounted latch provided on the inner component, the releasable latch means having two operational modes in the first of which the inner and outer components are fixedly engaged for rotary motion and in the second mode of which the inner



component can rotate relative to the outer component, the pivotally mounted latch being resiliently biassed into one of the operational modes, and actuatable means for controlling the operational mode of the relesable latch means, the actuatable means comprising a releasing element for urging the pivotally mounted latch to move against the resilient bias and a pivotally mounted retaining latch operable to retain the releasing element in a position urging the pivotally mounted latch against the action of its resilient bias.

4,476,944

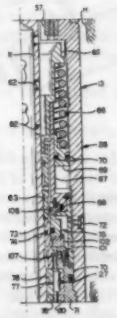
METHOD OF PROVIDING A FLUID SEAL IN DOWNHOLE DRILLING APPARATUS

Herbert W. Beimgraben, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Division of Ser. No. 023,420, Mar. 23, 1979,. This application Mar. 20, 1981, Ser. No. 245,771

Int. Cl.³ E21B *4/02*

U.S. Cl. 175—65 **2 Claims**



1. A method of well drilling incorporating pressured mud comprising the steps of:

(1) connecting a drive shaft between a mud-driven motor and a drill bit;

(2) surrounding a portion of said drive shaft with a tubular housing defining an annular chamber containing a pair of axially spaced face seal housing bearings respectively cooperating with bearing surfaces on said shaft portion to absorb thrust forces on said drive shaft;

(3) positioning a spring backed annular piston in one axial end of said annular chamber to permit expansion of the volume of said annular chamber;

(4) displacing said annular piston and compressing said spring in said housing by filling said chamber with pressurized lubricating oil at the surface to maintain a fluid pressure on the oil in said chamber by said spring pressed piston at all times in excess of the mud pressure to prevent mud flow through said bearing surfaces;

(5) providing a mud passage through said drive shaft to circumvent the oil filled chamber portions of said housing; and

(6) connecting the housing to a hollow work string by which the assemblage is inserted in the well and supplied with pressured mud.

4,476,945

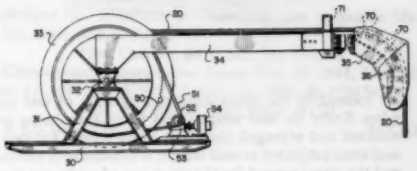
DRAINHOLD DRILLING

David D. Hearn, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 10, 1983, Ser. No. 465,407

Int. Cl.³ E21B *19/22*

U.S. Cl. 175—203 **3 Claims**



1. Apparatus for employing a coiled hose into a primary wellbore and for recovering said hose from said wellbore in a coiled manner comprising a base means, a support means carried by said base means, a drum means for carrying said hose in a coiled manner, said drum means being rotatably supported by said support means, a rigid beam pivotally carried by said support means and extending away from said drum means so that said hose passes to or from said drum means along said beam, a guide means fixed to the end of said beam furthest from said drum means for guiding said hose from said furthest end of said beam down into said primary wellbore or out of said primary wellbore up to said beam, said hose when being employed or received being under tension and said beam supporting said hose being under compression, at least one of said beam and guide means carrying means adapted to be supported by a well drilling derrick so that when employing or receiving said hose the tension force in said hose is essentially matched by the compression force in said beam and essentially only vertical external forces are applied to said apparatus with the result that essentially no lateral external forces are applied to said base means thereby eliminating the need to rigidly fix said base means to the earth or other support means when said apparatus is in use.

4,476,946

WEIGHT MEASURING ARRANGEMENT FOR COOKING APPLIANCE SURFACE UNIT

Peter H. Smith, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 3, 1982, Ser. No. 438,764

Int. Cl.³ G01G *19/52, 3/11, 3/08, 19/00*

U.S. Cl. 177—144 **11 Claims**

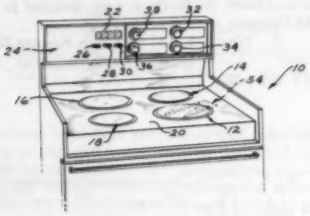
1. A weight measuring arrangement for a cooking appliance having a cooktop with an opening formed therein for receiving a surface heating unit of the type adapted to carry loads placed thereon for heating, said arrangement comprising:

at least one surface heating unit received in an opening in the cooktop;

support means for supporting said surface unit in the opening

in the cooktop, said support means comprising three cantilever arms mounted adjacent the opening and extending beneath said surface unit, said heating unit being supported from the free end of each of said arms at three support points, said support points being arranged such that said weight is equally distributed among said three points;

transducer means responsive to the flexing of said cantilever arms and operative to generate an output signal representative of the weight of the load carried on said heating unit; said transducer means comprising strain gage means



for measuring the strain exhibited by each of said arms when flexed by said weight; said three arms being constructed and arranged such that strain sensed for two of said arms subjected to said weight is substantially identical and the strain sensed for the third one of said arms is one half-that of said two arms;

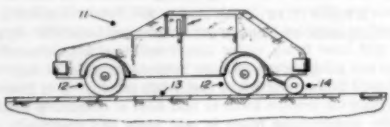
said strain gage means comprising two sets of two strain gages, each gage in one set of gages being positioned to sense the strain of a corresponding one of said two arms and both gages in the remaining set of gages being arranged to sense the strain of said third arm.

4,476,947

ELECTRIC CAR AND ROADWAY SYSTEM

Jay D. Rynbrandt, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 26, 1981, Ser. No. 277,521
Int. Cl.³ B60L *9/02*
U.S. Cl. 180—2.1 **14 Claims**



1. An electrically powered vehicle transportation system, comprising:

a roadway having a substantially smooth outer surface;

an electrically powered vehicle including electric propulsion means for powering said vehicle;

an electric power strip extending longitudinally of said roadway to be substantially flush therewith, said power strip divided into a plurality of electrically isolable segments that extend a fixed distance along said roadway, said segments including at least one air of elongated laterally spaced electrical conductors;

an electrical power supply bus;

electric feeder means connected between said supply bus and each of said segments of supplying power thereto;

a pair of electrical contact means mounted on said vehicle to engage said power strip for supplying power to said propulsion means, said contact means being spaced apart a distance substantially equal to the lateral spacing of said pair of electrical conductors of said segments so that said vehicle may be driven on said roadway with one of said pair of contact means in contact with one of said electrical conductors and the other of said pair of contact means contacting the other of said pair of electrical conductors;

means for determining the position of said contact means with respect to said power strip, and means for moving said contact means laterally with respect to said vehicle so as to position each of said contact means on one of said electrical conductors of said segments;

means onboard said vehicle for applying a signal voltage through said electrical contact means to said segments as said vehicle moves from one of said segments to another; and

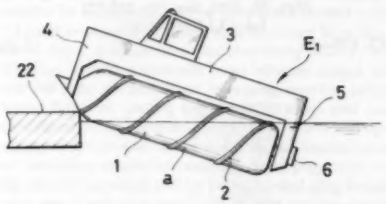
voltage-sensing controller means connected in electrical circuit with each of said feeder means for controlling the supply of power to its respective segments, said controller means sensing whether a signal voltage is being applied to said segment to prevent the supply of power thereto when no signal voltage is applied and said actuator means permitting power to be supplied to said segment when a vehicle having said onboard means is present and said voltage has been applied and thereafter power is being withdrawn from said segment to said vehicle.

4,476,948

AMPHIBIAN VEHICLE

Mikihisa Komoto, and Masatoshi Nakamura, both of Tokyo, Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1982, Ser. No. 392,068
Claims priority, application Japan, Feb. 27, 1982, 57-31005
Int. Cl.³ B60F *3/00*
U.S. Cl. 180—7.2 **6 Claims**



1. An amphibian vehicle for use in ice-forming water areas having a vehicle body, and at least a pair of floaters attached to said vehicle body, each of which floaters consists of a bouyant cylindrical body having a tapered forward end, and a helical blade fixed to the outer circumferential surface of said cylindrical body including said tapered end, characterized in that the waterline of said amphibian vehicle at the front of each of said floaters is not higher than the centerline thereof, with the waterline of said amphibian vehicle at the rear of each of said floaters not higher than 30% of the floater diameter above the centerline of each of said floaters.

4,476,949

MOTORIZED WHEELCHAIR AND MEANS FOR STEERING THE SAME

Albert L. Patton, 46976 W. Bursley Rd., Wellington, Ohio 44090

Filed Apr. 29, 1982, Ser. No. 372,964
Int. Cl.³ B60K *1/00*
U.S. Cl. 180—65.1 **9 Claims**

1. A motorized wheelchair comprising:

a pivotally mounted rear wheel for altering the wheelchair;

a pair of front wheels which transmit driving force for locomotion;

a chassis interconnected between said front and rear wheels;

a power source for effecting locomotion maintained upon said chassis;

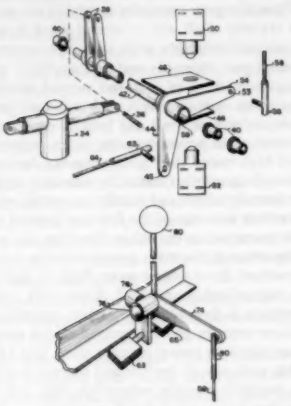
a means for steering having an electro-mechanical activator and a pivot shaft having attached thereto a plurality of shaft pivot links, said pivot links rotating in unison with said pivot shaft;

a body fitting over said chassis;

a seat for an occupant; and

wherein said means for steering further comprises:

a pair of microswitches secured upon a first said shaft pivot link such that activation buttons of said microswitches face each other;



a steering control pivot link having a switch engagement plate, the latter being disposed between said facing activation buttons of said microswitches and wherein rotation of said steering control pivot link effects activation of one of two said microswitches;

second and third said shaft pivot links in mechanical linkage with said electromechanical actuator and wherein said electromechanical actuator is actuated by either of said microswitches;

a steering control rod secured to said first shaft pivot link; and

a joy stick control mechanically linked to said steering control pivot link.

4,476,950

DRIVE ASSEMBLY FOR VEHICLE WHEEL

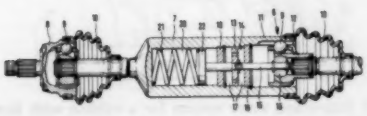
Hans-Heinrich Welschof, Rodenbach, Fed. Rep. of Germany, assignor to Löhr & Brompkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 426,177

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1981, 3140540

Int. Cl.³ B60K *17/22*

U.S. Cl. 180—73.3 **3 Claims**



1. A drive assembly for a motor vehicle wheel having an independent wheel suspension comprising:

drive means for driving said wheel;

an axially movable universal joint including an inner joint member in driven engagement with said drive means and an outer joint member having a generally cylindrical extension extending axially beyond said joint toward said wheel;

an axially fixed universal joint connected in driving engagement between said wheel and said axially movable universal joint; and

a fluidic shock absorber interposed between said fixed universal joint and said movable universal joint, said shock absorber comprising

a cylindrical member defined by said outer joint member extension,

a piston member in sliding engagement with said cylindrical member,

a piston rod attached between said piston member and said inner joint member of said movable universal joint, and

a ball joint interposed between said piston rod and said inner joint member of said movable universal joint.

4,476,951

ENGINE FOR MOTORCYCLES

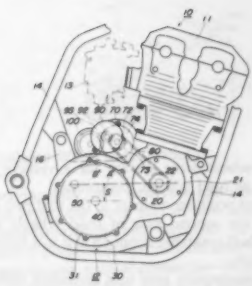
Toshifumi Ito, Tokorozawa, Japan, assignor to Honda Motor Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1982, Ser. No. 434,002

Claims priority, application Japan, Oct. 13, 1981, 56-162998; Oct. 13, 1981, 56-151691[U]; Oct. 29, 1981, 56-173476

Int. Cl.³ B62M *7/02*; F02N *11/00*

U.S. Cl. 180—219 **14 Claims**



1. An engine for a motorcycle, comprising:

a crankshaft extending transversely of said motorcycle;

a crankcase accommodating said crankshaft and having an upper surface;

a mainshaft arranged to be rotatively driven by said crankshaft;

a clutch interposed between said crankshaft and said mainshaft, for selectively allowing transmission of power from the former to the latter and interrupting same;

a countershaft engaging with said mainshaft;

a transmission case structure accommodating said mainshaft, said countershaft, and said clutch and having an upper surface upon which one or more accessories may be arranged;

said mainshaft being located at a level lower than said crankshaft and said countershaft;

a generator arranged on said upper surfaces of said crankcase and transmission case structure, said generator having a drive shaft disposed parallel with said crankshaft;

a starting motor arranged on said upper surfaces of said crankcase and said transmission case structure, said starting motor having an output shaft disposed parallel with said crankshaft, said output shaft having one end disposed adjacent one end of said drive shaft of said generator;

said drive shaft of said generator and said output shaft of said starting motor extending from said one ends thereof in opposite directions away from each other;

first power transmitting means drivingly coupling said generator and said starting motor; and

second power transmitting means drivingly coupling said generator and said crankshaft.

6. The engine for a motorcycle as claimed in claim 1, including a pair of hangers for fitting said engine to a main frame of said motorcycle, and wherein one of said hangers is arranged at one side of said engine at a location close to said generator.

4,476,952

FOUR-WHEEL VEHICLE DRIVE SYSTEM

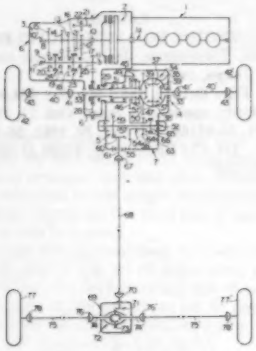
Kunihiko Suzuki, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 30, 1982, Ser. No. 430,726

Claims priority, application Japan, Nov. 25, 1981, 56-188939; Feb. 12, 1982, 57-20937

Int. Cl.³ B60K *17/34, 23/08*

U.S. Cl. 180—247 **8 Claims**



1. A four-wheel drive system for a vehicle with first and second pairs of road wheels, comprising

a power unit positioned closer to the first pair of road wheels than to the second pair of road wheels and having an output shaft rotatable about an axis in a lateral direction of the vehicle;

a power transmission gear unit including transmission input and output shafts each having an axis of rotation in a lateral direction of the vehicle;

a final reduction gear rotatable about an axis parallel with the respective axes of rotation of the transmission input and output shafts, the transmission output shaft being held in driving engagement with said final reduction gear;

a main transaxle gear casing having enclosed therein said transmission gear unit and said final reduction gear;

an auxiliary transaxle gear casing secured to said main transaxle gear casing;

a hollow main power transfer shaft enclosed within the auxiliary transaxle gear casing and rotatable about an axis substantially aligned with the axis of rotation of said final reduction gear;

a low-and-high speed shift gear assembly enclosed within said auxiliary transaxle gear casing and comprising an auxiliary power transfer shaft substantially parallel with said main power transfer shaft, at least two main power transfer gears rotatable about axes substantially aligned with the axis of rotation of said main power transfer shaft, and at least two auxiliary power transfer gears mounted on said auxiliary power transfer shaft and rotatable about axes substantially aligned with the axis of rotation of the auxiliary power transfer shaft;

a first wheel drive gear unit enclosed within said auxiliary transaxle gear casing and comprising a differential gear assembly including an input member rotatable with one of said main power transfer gears about an axis substantially aligned with the axis of rotation of said main power transfer shaft and a pair of output members operatively connected to said first pair of road wheels through a pair of side gear shafts, respectively, at least one of said side gear shafts axially extending through said hollow main power transfer shaft;

a second wheel drive gear unit comprising a differential gear assembly operatively connected to the second pair of road wheels of the vehicle; and

a right-angle power transfer gear unit enclosed within said auxiliary transaxle gear casing and operative to transmit driving power from said auxiliary power transfer shaft to the differential gear assembly of the second wheel drive gear unit in a fore-and-aft direction of the vehicle,

said main power transfer gears consisting of a first main power transfer gear coaxially rotatable on said first main power transfer shaft and a second main power transfer gear coaxially rotatable with said input member of said differential gear assembly and said auxiliary power transfer gears consisting of first and second auxiliary power transfer gears rotatable with each other on said auxiliary power transfer gear shaft and held in mesh with the first and second main power transfer gears, respectively, said low-and-high speed shift gear assembly further comprising a coupling member coaxially rotatable with said main power transfer shaft and axially movable selectively in one direction into one of the first and second main power transfer gears and in the other direction into engagement with the other of the main power transfer gears.

2. A four-wheel drive system as set forth in claim 1, further comprising two-wheel/four-wheel drive shift clutch means which comprises a first clutch member rotatable with said auxiliary power transfer gears, a second clutch member rotatable with said auxiliary power transfer shaft, and a third clutch gear rotatable with one of the first and second clutch members and axially movable thereon selectively into and out of the other of the first and second clutch members.

4,476,953

FOUR-WHEEL VEHICLE DRIVE SYSTEM

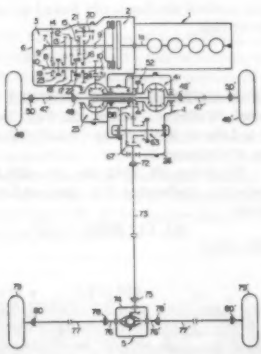
Kazuyoshi Hiraiwa, Atsugi, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 26, 1982, Ser. No. 411,814

Claims priority, application Japan, Oct. 12, 1981, 56-162355

Int. Cl.³ B60K *5/04, 17/34*

U.S. Cl. 180—249 **10 Claims**



1. A four-wheel drive system for a vehicle with first and second pairs of road wheels, comprising

a power unit having an output shaft rotatable about an axis in a lateral direction of the vehicle;

a power transmission gear unit including transmission input and output shafts each having an axis of rotation in a lateral direction of the vehicle;

a final reduction gear rotatable about an axis parallel with

the respective axes of rotation of the transmission input and output shafts, the transmission output shaft being held in driving engagement with said final reduction gear;

a main transaxle gear casing having enclosed therein said transmission gear unit and said final reduction gear;

an auxiliary transaxle gear casing secured to said main transaxle gear casing;

a central differential gear assembly enclosed within said main transaxle gear casing and including a differential gear housing coaxially rotatable with said final reduction gear about the axis of rotation of the final reduction gear and two output members enclosed within said differential gear housing and rotatable at different speeds about axes substantially aligned with the axis of rotation of the differential gear housing;

a first wheel drive gear unit enclosed within said auxiliary transaxle gear casing and comprising a differential gear assembly operatively connected to the first pair of road wheels of the vehicle and including an input member rotatable with one of the two output members of the central differential gear assembly about an axis in a lateral direction of the vehicle;

intermediate gear means enclosed within said auxiliary transaxle gear casing and including an input gear rotatable with the other of the two output members of the central differential gear assembly about an axis substantially aligned with the axis of rotation of the output member of the central differential gear assembly;

a second wheel drive gear unit comprising a differential gear assembly operatively connected to the second pair of road wheels of the vehicle; and

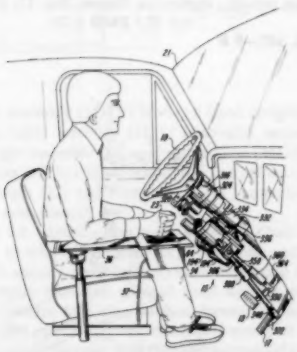
right-angle power transfer gear means enclosed within said auxiliary transaxle gear casing and operative to transmit driving power from said intermediate gear means to the differential gear assembly of the second wheel drive gear unit in a fore-and-aft direction of the vehicle.

4,476,954

REMOTE CONTROL FOR MOTOR VEHICLE

Dale R. Johnson, Boulder, and John A. Ciciora, Denver, both of Colo., assignors to Johnson Engineering Corporation, Boulder, Colo.

Filed Sep. 22, 1982, Ser. No. 421,599
Int. Cl.³ B60K *31/00*
U.S. Cl. 180—333 **17 Claims**



1. A control system for a motor vehicle having a rotary steering mechanism, a throttle mechanism, and a brake mechanism, said control system comprising:

command means having a first portion displaceable in at least four different directions, and a second portion responsive to displacement of said first portion in different ones of said directions providing electrical signals indicative of commanded changes in the direction and speed of said vehicle;

electrically responsive means including a rotary actuator for causing rotation of said steering mechanism and linear actuators, including rack and pinion mechanisms, for actuating said throttle and brake mechanisms; and

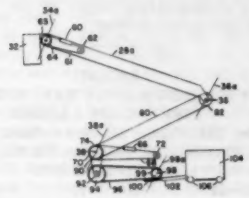
signal processing means connected with said second portion of said command means and said electrically responsive means, said signal processing means, responsive to received electrical signals indicative of commanded changes in vehicle direction, causing said electrically responsive means to effect rotation of said steering mechanism, and responsive to received electrical signals indicative of commanded changes in vehicle speed, causing said electrically responsive means to effect actuation of at least one of said throttle and brake mechanisms.

4,476,955

ARTICULATED POWERED LIFT MACHINES

Jerry A. Carter, 20162 Spruce Ave., SW., Santa Ana, Calif. 92707

Filed Jun. 22, 1981, Ser. No. 276,307
Int. Cl.³ E04G *1/00*
U.S. Cl. 182—2 **6 Claims**



1. In an articulated lift, in combination:

a base structure;

a boom overlying said base structure and comprising first and second arms, the inner end of said first arm having pivotal connection to the base structure on a first generally horizontal pivot axis, said second arm overlying said first arm and having pivotal connection at its inner end to the outer end of said first arm on a second, generally horizontal pivot axis;

means for pivoting said second arm relative to said first arm independently of movement of said first arm such that the outer end of said second arm is moved arcuately about said second pivot axis;

means for pivoting said first arm relative to said base such that the outer end of said first arm and said second arm are moved arcuately about said first pivot axis;

summing means for finding the algebraic sum of the rotation of said first and second arm about said first pivot axis relative to said base and rotation of said second arm about said second axis relative to said first arm;

counterweight means in the form of a counterweight carried by said base and movable toward and away from said first pivot axis; and

means for altering the distance from said counterweight to said first pivot axis as a function of said algebraic sum in response to changes in said algebraic sum.

4,476,956

SLIDE FOR FRICTIONAL ENGAGEMENT WITH FLEXIBLE DESCENT LINE

Leroy O. Eger, 2320 N. 33rd St., Lighthouse Point, Fla. 33064

Filed Aug. 26, 1983, Ser. No. 526,671
Int. Cl.³ A62B *1/14, 1/20*
U.S. Cl. 182—5 **13 Claims**

1. In a slide for frictional engagement with a flexible line, said slide having first and second members for receiving the

line between them with said second member frictionally engaging the line, the improvement wherein:

one of said members is adjustable with respect to the other to vary the length of the line which is frictionally engaged by said second member;

said first member being an outer shell which has a longitudinal passageway therein and being open on opposite sides of said passageway for passing the line into and out of the shell;

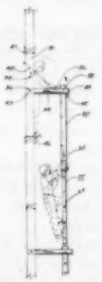
and said second member extending into said passageway in the outer shell and being rotatably adjustable therein to wind a corresponding length of the line frictionally around said second member.

4,476,957

UNITARY WINDOW SAFETY BARS AND EXTERIOR FIRE ESCAPE LADDER

Harry J. Ory, 2812 Painter St., New Orleans, La. 70122

Filed Nov. 30, 1983, Ser. No. 556,729
Int. Cl.³ E06C *9/10*
U.S. Cl. 182—21 **9 Claims**



1. A unitary window safety window bars and exterior fire escape ladder comprising:

(a) inner and outer frame means slidably interfitting along a common slide axis and adapted to fit, when slidably coincident, in a window casing, having sides, sill and lintel, of a building wall;

(b) a plurality of bars transversely fixed in at least the inner of said frame means and equally spaced apart along said slide axis for dual use as safety bars and ladder rungs;

(c) frame mounting means for pivotally securing said frame means to said window casing sides adjacent the lintel and to provide handrails for ladder use; and

(d) locking means mounted in said window casing and building wall for inside locking anyone of said frame means and bars in coincidence and to said window casing as window safety bars, and for unlocking said coincident frame means and bars from said window casing and for outwardly pivoting said coincident frame means and bars outwardly clear of the window sill and slidably downward as an exterior fire escape ladder, easily and safely enterable from standing position on said sill by grasping said handrails; and

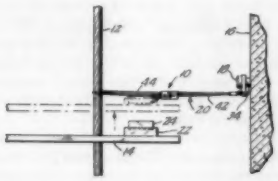
(e) stop bar means, mounted on said inner frame means upper end and on said outer frame means lower end, adapted to engage for the prevention of downwardly sliding separation of said frame means.

4,476,958

SAFETY DEVICE FOR SCAFFOLD

Lawrence Stafford, 8 Gracemore St., Albany, N.Y. 12203

Filed Sep. 7, 1982, Ser. No. 415,756
Int. Cl.³ E04G *5/04*
U.S. Cl. 182—82 **10 Claims**



1. A safety system, comprising:

(a) a plurality of anchors secured to a building;

(b) yoke means having a generally U-shaped element configured and dimensioned to be fitted on and secured around one of said plurality of anchors, said anchors having support and heads and being disposed vertically at spaced intervals along the outside surface of the building;

(c) spring means for maintaining said yoke means on said anchors;

(d) a scaffold; and

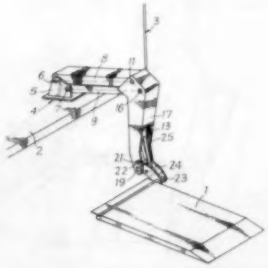
(e) lanyard means secured to said yoke means and adapted to be secured to said scaffold which moves vertically along the side of the building.

4,476,959

PLATFORM LIFTING DEVICE MOUNTED ON A MOTOR VEHICLE

Christian Tortellier, Taverny, France, assignor to Manutis, France

Filed Jun. 15, 1982, Ser. No. 388,691
Claims priority, application France, Jun. 17, 1981, 81 11945
Int. Cl.³ B66B *9/20*
U.S. Cl. 187—9 R **4 Claims**



1. A platform lifting device mountable on the floor of a vehicle comprising a mounting plate for mounting on said floor of said vehicle, a first connecting arm including a first end and a second end, said first end of said first connecting arm being pivotably connected to said mounting plate, a second connecting arm including a first end and a second end, said first end of

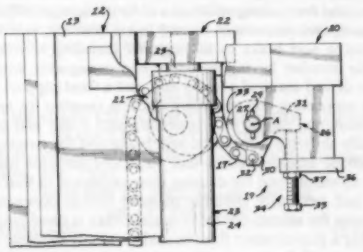
said second connecting arm being pivotably connected to said mounting plate, a bearing arm including a first end and a second end, said first end of said bearing arm being pivotably connected to said second ends of both said first and second connecting arms at spaced apart locations on said bearing arm, whereby said pivotable connections at said first and second ends of said first and second connecting arms form a parallelogram, a lever member including a first end and a second end, said first end of said lever member being pivotably connected to said second end of said bearing arm, a jack member having a first end and a second end relatively movable between retracted and extended positions, said first end of said jack member being pivotably mounted to said first connecting arm at a point intermediate of said first and second ends thereof, and said second end of said jack member being pivotably mounted to said lever member at a point intermediate of said first and second ends thereof, a platform fixedly connected to said second end of said lever member, whereby retraction of said jack member causes said bearing arm to pivot about said pivotable connections with said first and second connecting arms at said first end of said bearing arm, in turn causing said parallelogram to deform in a manner so as to pivot said first and second connecting arms about said pivotable connections of said first and second connecting arms with said mounting plate, thereby lifting said platform.

4,476,960

ADJUSTABLE CHAIN ANCHOR FOR LIFT TRUCKS

William T. Yarris, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Aug. 9, 1982, Ser. No. 406,617
Int. Cl.³ B66B 9/20
U.S. Cl. 187—9 E **8 Claims**



1. In a mast assembly (11/11') having a fixed upright assembly (12), a movable assembly (15/41') movably mounted on said fixed upright assembly (12), and a lift system (16) including a least one chain (17) having opposite ends thereof anchored to said fixed upright (12) and movable (15/41') assemblies, the improvement comprising:

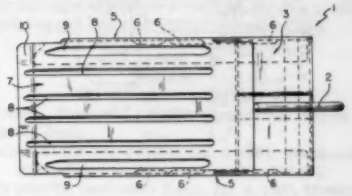
means (19) for adjusting the tension in said chain (17) in response to selective rotation of at least one end of said chain (17) about a pivot axis (A) including a cam member (26) pivotally mounted on said fixed upright assembly (12), an arcuate (33) cam surface formed on said cam member (26) and having said chain (17) wrapped in bearing relationship thereon, first (30) and second (31) circumferentially spaced arms secured on said cam member (26) to extend radially outwardly therefrom, said chain (17) attached to said first arm (30), and adjustment means (34) for engaging said second arm (31) to selectively pivot said member (26) about said axis (A), including a bolt (35) threadably mounted on said fixed upright assembly (12) and having an end thereof engaging said second arm (31).

4,476,961

PROCESS FOR PERFORMING THE CONSTRUCTION OF A PARKING GRIP CHOCK FOR A VEHICLE AND PARKING GRIP CHOCK FOR A VEHICLE MANUFACTURED FROM SHEET

Picotti Luigi, Frazione di Provaglio, Via Europa, 16, 25040 Camignone (Brescia), Italy

Filed Dec. 7, 1982, Ser. No. 447,648
Claims priority, application Italy, Dec. 16, 1981, 68630 A/81
Int. Cl.³ B60T 3/00; B23K 31/00
U.S. Cl. 188—32 **11 Claims**



1. A process for performing the construction of a parking grip chock (1) for a vehicle, in particular for a truck, the said chock (1) being made from sheet and being substantially wedge-shaped, an upper surface (7) of the said chock (1), opposite to a supporting lower surface of the same, being suited to cooperate with a wheel of the said vehicle, characterized in that it comprises: at least a blanking operation, from a flat metallic band (12), of a blank (15) having a predetermined shape and obtained in a single flat piece, and at least a bending operation, carried out by means of consecutive operations, of the said blank (15), in order to impart to it a shape substantially wedged, bent and overlapped edges of the said blank being mutually joined.

11. A parking grip chock (1) for a vehicle, in particular for a truck, the said chock (1) being made from sheet and being substantially wedge-shaped, an upper surface (7) of the said chock (1), opposite to a supporting lower surface (4) of the same, being suited to cooperate with a wheel of the said vehicle, characterized in that it is formed from a single blanked and bent piece (15) having a flat development substantially with the shape of an isoseceles trapezoid, a central portion of which (16) defines the said upper surface (7) and two symmetrical lateral portions (18, 19) of which define two lateral walls (5) of the said chock (1), a first pair of tongues (21) bent at right angle and obtained integral with the said lateral portions (18, 19) defining a rear wall (3) of the said chock (1) and a second pair of tongues (20) bent at right angle and obtained integral with the said lateral portions (18, 19) defining the said supporting lower surface (4) of the said chock (1), the said tongues (20, 21) being mutually secured by means of welding spots.

4,476,962

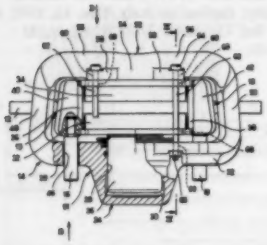
DISC BRAKE HAVING A SLIDING YOKE

Joaquim F. Bofill, Barcelona, Spain, assignor to Bendiberica S.A., Barcelona, Spain

Filed Dec. 16, 1982, Ser. No. 450,506
Int. Cl.³ F16D 55/224
U.S. Cl. 188—71.1 **7 Claims**

1. A disc brake including a yoke (14) slidingly supported, by means of at least one axially extending pin (16, 18), onto a stationary support (10) within which are anchoringly and slidingly received two friction members (32, 34) adapted to come into friction engagement with the opposite faces of a rotating disc (12) upon actuation of actuating means constituted by at least a brake motor (24, 24', 24") acting directly onto one (32) of said friction members and indirectly onto the other (34) of said friction members by reaction through said sliding yoke (14), said pins (16, 18) extending into bores (46) formed in axially mating relationship in said stationary support

(10) and in said yoke (14), wherein said yoke (14) is in the form of a closed frame disposed around said stationary support (10) and includes at least one elongated axially extending reinforcing member (62, 62') arranged radially beyond the periphery of said disc (12) and interconnecting a first part (51) of said yoke on the side of said brake motor (24) and an opposite second



part (52) of said yoke (14) adapted to urge said other (34) friction member at a first zone (54) more remote radially outwardly than the pressure center (A) of said brake motor, said other (34) friction member being also urged by said second part (52) of said yoke at a second zone (56) less remote radially outwardly than said pressure center (A) of said brake motor.

4,476,963

AUTOMATIC ADJUSTER FOR A SHOE DRUM BRAKE

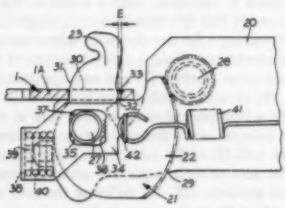
Christopher W. Palmer, Birmingham, and Ronald M. Hughes, West Midlands, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Nov. 30, 1981, Ser. No. 325,643

Claims priority, application United Kingdom, Dec. 6, 1980, 8039220; Jun. 4, 1981, 8117121

Int. Cl.³ F16D *51/52, 65/38*

U.S. Cl. 188—79.5 B **5 Claims**



1. An automatic adjuster for a shoe drum brake having an automatically variable length operable, in use, in response to wear of the brake shoe linings, to maintain a predetermined maximum shoe to drum clearance, comprising a two-part strut extending between the shoes of the brake, a first strut part operatively connected to one brake shoe, a second strut part in the form of an adjuster lever pivotally mounted on said first strut part, a projection on said lever operatively connected with the other brake shoe, rigid toothed means on said first strut part, means on said adjuster lever operatively engageable with said toothed means to prevent angular movement of said adjuster lever about its pivotal mounting when in the engaged position, means to facilitate disengagement of said lever from said toothed means and angular movement of said lever due to excessive separation of the brake shoes upon brake actuation as a result of wear of friction linings on the brake shoes, so that upon release of the brake said lever re-engages said toothed means in a different position to increase the effective length of said two-part strut, a movable locking device operably engageable with said adjuster lever in a locking position to prevent said angular movement of said adjuster lever when moved into engagement therewith, and a thermally responsive body of shape memory effect material operatively engaging said locking device to move said locking device into said locking position, at least during brake actuation, in response to a predetermined increase in temperature of the brake to prevent said angular movement of said adjuster lever.

4,476,964

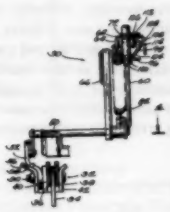
SEAT-BRAKE INCLUDING LOCKOUT

Donald E. Broman, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Mar. 11, 1982, Ser. No. 357,054

Int. Cl.³ F16D *65/14, 55/16*

U.S. Cl. 188—109 **7 Claims**



1. A seat brake for use in a vehicle having a frame, a seat, at least a portion of said seat being movable with respect to said frame between a lower position when weight is placed on the seat and an upper position when weight is removed from the seat, and a brake selectively engageable to brake said vehicle, said seat brake comprising means for causing said brake to be engaged when said portion of said seat moves to said upper position and for causing said brake to be disengaged when said portion of said seat moves to said lower position, said means for causing said brake to be engaged including a vertically shiftable member having an upper end engageable with said portion of said seat and a lower end, and a fixed support member for supporting said vertically shiftable member for vertical movement, and means for connecting said lower end of said vertically shiftable member to said brake and for causing said brake to be engaged when said vertically shiftable member moves upwardly and for causing disengagement of said brake when said vertically shiftable member moves downwardly, and means for selectively locking said brake is disengagement including a stop member fixed to said vertically shiftable member below said fixed support member and movable with said vertically shiftable member toward and away from said fixed support member, a locking member including an upper end and a lower end, and means for supporting said locking member for pivotal movement between a first position wherein said locking member is positioned between said stop member and said fixed support member and wherein said lower end of said locking member engages said stop member and said upper end of said locking member engages said fixed support member to prevent upward movement of said stop member and said vertical member and a second position wherein said stop member and said vertically shiftable member are freely movable with respect to said locking member and said fixed support member.

4,476,965

ELECTROMAGNETIC BRAKE WITH CAM RELEASE

Henry M. Brown, Jr., Leicester, and Andrew J. Fredette, North Oxford, both of Mass., assignors to Dana Corporation, Toledo, Ohio

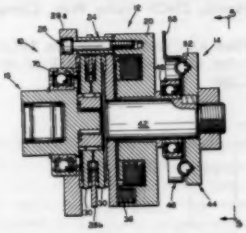
Filed Aug. 9, 1982, Ser. No. 406,697

Int. Cl.³ F16D *65/30*

U.S. Cl. 188—171 **2 Claims**

1. In an electromagnetic brake having an axis and including

an electromagnetic housing assembly, said assembly having an energizable coil and an armature ring in spaced relationship therewith along said axis, said brake further including a spring, said armature ring being biased by said spring in a direction opposing the energizing forces of said coil thereon, said brake further including one set of friction rings and one set of friction rotors, said sets being axially interleaved and axially moveable relative to each other, said set of friction rings being rotatably mounted with respect to said electromagnetic housing assembly, said set of friction rotors being rotatably mounted with respect to said assembly, said sets of rings and rotors being urged into engagement with each other along said axis by said bias of said spring against said armature ring, an axially moveable shaft, said armature ring being fixed to a first end of said axially moveable shaft; an improvement comprising a cam release device fixed to a second end of said axially moveable shaft, said cam release device including a torque arm rotatable relative to said shaft about said axis between two limits of an arc, whereby said device effects movement of said armature ring against the bias of said spring, said cam release device comprising a plurality of balls and ball engaging radially disposed ramps, a cam hub member fixed to said axially moveable shaft, said ramps being disposed in a stamped cam plate, said plate being rotatable relative to said axially moveable shaft, said balls being annularly spaced apart and undisplaceably seated within said cam hub member.

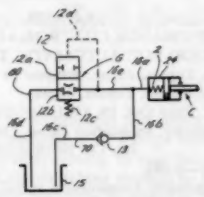


4,476,966

HYDRAULIC CRANE HOIST CONTROL LEVER VELOCITY LIMITING DEVICE

William R. Bath, and Danny Be'er, both of 6116 Cunningham, Houston, Tex. 77041

Filed May 31, 1983, Ser. No. 499,368
Int. Cl.³ F16F 9/49
U.S. Cl. 188—280 **12 Claims**



1. A device for limiting the velocity of movement of a control lever of a hydraulic crane hoist from a first position where the hydraulic crane hoist is stationary to a second position where the hydraulic crane hoist is moving, comprising:

a housing formed having a fluid circuit therein;

a pressurizing cavity formed within said fluid circuit and communicating with the exterior of said housing;

a pressurizing component slidably mounted within said pressurizing cavity;

linkage means operably connected with the control lever and said pressurizing component for transmitting movement of the control lever to said pressurizing component;

said pressurizing component pressurizing said fluid circuit when said pressurizing component is moved from a neutral position where the control lever is in the first position to a pressurizing position where the control lever is moved from the first position toward the second position;

biasing means within said pressurizing cavity in engagement with said pressurizing component for biasing said pressurizing component towards said neutral position; and,

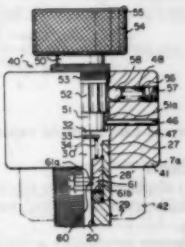
flow restricting means in said fluid circuit for limiting the velocity of movement of said pressurizing component from said neutral position to said pressurizing position for regulating the hydraulic crane hoist operations.

4,476,967

HYDRAULIC DAMPER

Kato Tetsuo, Kanagawa, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Continuation of Ser. No. 281,210, Jul. 6, 1981, abandoned. This application Sep. 26, 1983, Ser. No. 535,532
Claims priority, application Japan, Jul. 4, 1980, 55-94929[U]; Jul. 4, 1980, 55-94930[U]
Int. Cl.³ F16F 9/44
U.S. Cl. 188—319 **5 Claims**



1. A hydraulic damper comprising:

a cylinder receiving therein hydraulic liquid;

a piston movable within said cylinder and partitioning the interior thereof into first and second liquid filled chambers;

a piston rod extending through said first chamber and having an inner end secured to said piston and an outer end positioned exteriorly of said cylinder, said piston rod having an axial bore extending therethrough, said outer end having an interior counterbore receiving therein a seal means;

an elongated adjusting rod positioned within said bore in said piston rod and defining therewith a passage, said adjusting rod contacting said seal means;

a radial bore in said piston rod connecting said passage to said first chamber;

an orifice member mounted on said inner end of said piston rod, said orifice member having therethrough an orifice connecting said passage to said second chamber;

said adjusting rod having an inner end cooperating with said orifice member to define the size of said orifice;

means, axially adjustably mounted on said outer end of said piston rod, for moving said adjusting rod axially within said bore, and thereby adjusting the size of said orifice;

an annular guide positioned within said counterbore directly, biasingly engaging said seal means, said annular guide having in an inner circumference thereof an annular recess cooperating with said seal means to define first and second axially spaced stops; and

a third stop on said adjusting rod for contact with said first and second stops to define maximum outer and inner positions, respectively, of said adjusting rod, thereby to define maximum and minimum sizes, respectively, of said

orifice, and to define a maximum range of possible axial movement of said adjusting rod with respect to said piston rod.

4,476,968

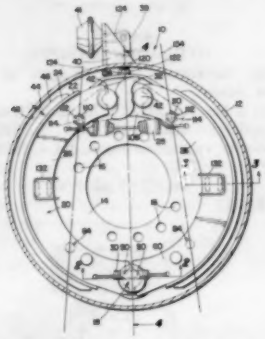
EXPANDING SHOE DRUM BRAKE

John A. Urban, Plainwell, and Peter L. Sherrick, Galesburg, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 314,621, Oct. 26, 1981, abandoned. This application Dec. 14, 1983, Ser. No. 561,141

Int. Cl.³ F16D *51/22*

U.S. Cl. 188—329 **6 Claims**



1. An improved cam actuated expanding shoe drum brake comprising:

a spider member;

a selectively displaceable brake actuation means fixed to said spider member, said actuation means comprising a rotatable cam,

a pivot structure comprising a single anchor pin having a headed portion and a shank portion fixed to said spider member;

a pair of generally arcuate radially outwardly movable brake shoes pivotably supported on said pivot structure, each of said brake shoes carrying a cam follower member at one end thereof engaged by said actuation cam for movement therewith, said actuation cam having a first position for allowing said shoes to be radially retracted and a second position for causing said shoes to be radially expanded;

each of said brake shoes comprising a web structure comprising at least one web, said web structure defining a first and a second generally parallel opposed surfaces, and a table structure generally perpendicular to said web structure and carrying friction material on the radially outer surface thereof, each of said webs provided with a generally semiarcuate cavity at the other end thereof pivotably retained on the shank portion of said anchor pin;

the improvement comprising means to locate said web structure on a predetermined plane relative to said spider in both the radially retracted and radially expanded positions thereof, said locating means comprising:

first and second spaced generally flat guide surfaces fixed to said spider and directly slidably engageable with said first surface of said web structure, a fixed third generally flat guide surface defined by the shoulder between the headed and shank portions of said anchor pin, said third guide surface spaced from and parallel to said first and second guide surfaces, said third guide surface axially spaced from said first and second guide surfaces by a distance generally equal to spacing between said first and second surfaces on said web structure and directly slidably engageable with said second surface on said web structure, said third guide surface not being on a straight line drawn from said first to said second guide surface, and means resiliently engaging said second surface of said web structure and applying a resilient force on said web structure in the direction toward the first surface thereof, said resilient means engaging said second surface on the opposite side of said line drawn from said first to said second guide surface as said third guide surface and comprising with said guide surfaces the only guide means for said brake shoes whereby said web structure will be constantly resiliently urged into sliding engagement with said first, second and third guide surfaces.

4,476,969

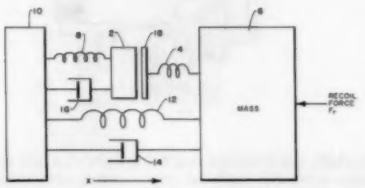
DYNAMIC RECOIL DAMPING MECHANISM

Owen W. Dykema, 23429 Welby Way, Canoga Park, Calif. 91307

Filed Apr. 12, 1982, Ser. No. 367,509

Int. Cl.³ F16F *7/10*; F41F *19/06*

U.S. Cl. 188—380 **8 Claims**



1. A dynamic mechanism for reducing recoil of a recoil mass subjected to periodic, unidirectional forces and for conditioning and transmitting said forces to a mounting base comprising:

an ancillary mass interposed between said base and said recoil mass;

relatively soft spring means for reducing the recoil of said ancillary mass and having a first means for engaging said base and a second means for engaging said ancillary mass;

relatively stiff spring means interposed between said recoil mass and said ancillary mass and having a third means for engaging either said recoil mass or said ancillary mass and having a fourth means for contacting the other said mass;

means to constrain said ancillary mass to perform periodic motion along the axis of the recoil force and between said recoil mass and said base whereby movement of said recoil mass by the force means and the maximum amplitude and shock-like character of the recoil force transmitted to said base are all reduced by the dynamic action of said ancillary mass and springs.

4,476,970

SPEED CHANGE CONTROL APPARATUS AND METHOD FOR AUTOMATIC TRANSMISSION

Hiroshi Ito, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 19, 1981, Ser. No. 312,928

Claims priority, application Japan, Oct. 31, 1980, 55-152181

Int. Cl.³ B60K *41/28*

U.S. Cl. 192—0.052 **7 Claims**

1. An automatic transmission speed change control for a vehicle comprising:

(a) a fluid type converter;

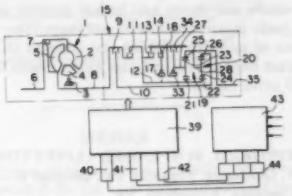
(b) a transmission gear connected in series with said converter and comprising a plurality of friction engaging elements operated during a speed change;

(c) a direct coupled clutch connected in parallel with said converter;

(d) a solenoid valve for controlling the supply of oil pressure to said direct coupled clutch to place said clutch in an engaging position or in a disengaging condition; and

(e) control means connected to said solenoid valve for determining the speed of said vehicle, the throttle valve open-

ing of a carburetor of said vehicle, and the shift position of said automatic transmission, and for controlling said solenoid valve so that said direct coupled clutch is maintained in an engaging condition until a speed change of said vehicle, at which time said direct coupled clutch is changed to a disengaging position until the end of said speed change when said direct coupled clutch is returned to an engaging position;



said control means comprising a plurality of timers each comprising first and second time counters, each of said timers corresponding to a different speed change, said first time counters establishing a time interval between disengagement of said direct coupled clutch and operation of said friction engaging elements, and said second time counters establishing a second time interval longer than said first time interval between disengagement of said direct coupled clutch and return of said direct-coupled clutch to an engaging position.

4,476,971

SAFETY DEVICE FOR CONVEYANCE SYSTEMS FOR PEOPLE

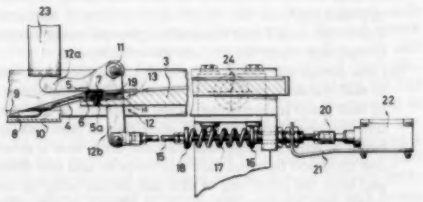
Klaus Schöneweiss, Hattingen, Fed. Rep. of Germany, assignor to O&K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Jun. 1, 1979, Ser. No. 44,422

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1978, 2824452

Int. Cl.³ B65G *43/00*

U.S. Cl. 198—323 **25 Claims**



1. In a safety device for a passenger transporter system for the prevention of the wedging in of foreign bodies, with a switching element, the latter serving to stop the transporter system when actuated, the switching element to be actuated within a stationary part of the intake by means of horizontally moveable comb segments, the improvement comprising

a carrier plate,

means for pivotally mounting said carrier plate about a first pivot point,

said comb segments are fastened to said carrier plate,

the switching element comprises a switch,

a push rod moveably mounted actuatably adjacent said switch,

an angle lever and means for pivotally mounting said angle lever about a second pivot point, said angle lever having legs angularly disposed relative to each other with respect to said second pivot point and operatively actuating said switch via said push rod,

switch rod means operatively engaging said comb segments and for pivoting said angle lever upon displacement of at least one of said comb segments,

one of the legs of said angle lever being operatively connected with said push rod,

spring means for biasing said push rod in a direction away from actuation of said switch and for operatively biasing said switch rod means so as to operatively engage said comb segments, said switch rod means upon displacement of said at least one comb segment for actuating said switch by the pivoting of said angle lever so as to move said push rod actuatingly against said switch whereby said switch is actuated and the passenger transporter system is stopped, and

means cooperating with said angle lever upon pivotal lifting of the carrier plate by swinging said carrier plate about said first pivot point for pivoting said angle lever so as to move said push rod actuatingly against said switch, whereby said switch is actuated and the passenger transporter system is stopped.

4,476,972

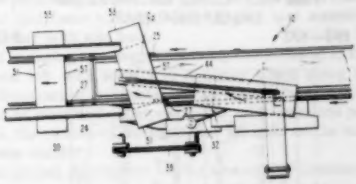
METHOD AND APPARATUS FOR TURNING FILLED CARTONS WITH POSITIVE ASSIST

John W. Bryson, Los Altos, Calif., assignor to Kliklok Corporation, Greenwich, Conn.

Filed Sep. 9, 1981, Ser. No. 300,601

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—415 **16 Claims**



1. A method of turning a carton with positive assist, the carton having a top, bottom, leading edge and sides, comprising the steps of,

conveying the carton along a predetermined path and having a first axis extending along the longitudinal axis of the path, turning the carton to provide reorientation with a second axis of the carton in alignment with the axis of the path, and

independently engaging the carton along at least one side at a portion of said one side which is adjacent the leading edge with a rotating finger having a sweeping action with a substantially fixed sweep radius and a transverse sweeping component across said path to push the carton so that said leading edge is shifted transversely during forward movement, thereby assisting the turn.

4,476,973

AUTOMATIC RECIPROCAL FEED MECHANISM

Sheldon Kessler, Chicago, and Vasilios Strubulis, Des Plaines, both of Ill., assignors to Pack-All, Inc., Chicago, Ill.

Filed Apr. 1, 1982, Ser. No. 364,437

Int. Cl.³ B65G *25/00*

U.S. Cl. 198—744 **24 Claims**

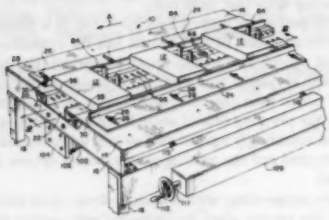
1. An apparatus for sequentially advancing a plurality of articles deposited one at a time on one end of a feed table across the feed table to a work station comprising:

a reciprocating pusher assembly mounted on the feed table and adapted to engage and advance each article across the

feed table from the one end when driven forward and to disengage from the article when driven in reverse;

drive means to reciprocally drive said pusher assembly;

laterally adjustable means movably supporting said pusher assembly;



selectively adjustable control means operably connected to said pusher assembly for changing the lateral position of said pusher assembly via said laterally adjustable means;

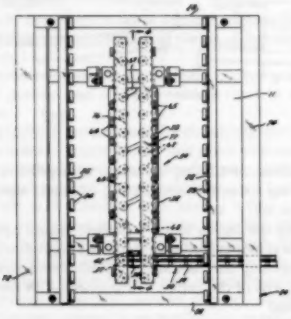
said pusher assembly including pushers, whereby the articles being advanced across said feed table by said pushers are maintained in an in-line feed mode regardless of the width of the articles.

4,476,974

CONTINUOUS ARTICLE HANDLING CONVEYOR

Bernard G. Bradbury, Chico, Calif., assignor to Rexnord Inc., Brookfield, Wis.

Filed Oct. 19, 1981, Ser. No. 313,005
Int. Cl.³ B65G *23/00*
U.S. Cl. 198—832 **5 Claims**



1. A conveyor, comprising:

a. a supporting structure defining a closed planar path;

b. an endless chain assembly adapted to move around said closed path, including:

i. a plurality of links each having a leading section parallel to the plane of said closed planar path, a trailing section parallel to the plane of said closed planar path, and a downwardly sloping section connecting said leading section with said trailing section, and an aperture extending through each leading and trailing section perpendicular to said closed planar path;

ii. a plurality of pallets, each fixedly attached to the top of said leading section of its respective link;

iii. a plurality of connecting pins pivotally connecting said leading sections of said links to the trailing sections of a preceding link through said respective apertures therein; each of said pins having a self-aligning bearing means circumscribing a portion thereof and lying within one of said apertures in said links for aligning one link with a preceding link, and a cam roller means fixedly attached to the other end of said pin for transmitting motive force to said endless chain assembly;

c. a cylindrical drive means disposed underneath said endless chain assembly and having a helical groove about its outer surface adapted to engage said cam roller means to provide motive force thereto such that said endless chain assembly will be moved along said closed planar path, said helical groove including widened, tapered ends so as to ensure a smooth lead-in and lead-out of said cam roller as it enters and leaves said helical groove; and

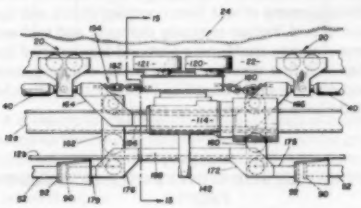
d. a guide means secured to said supporting structure in the area of said drive means and adapted to accept the side thrust imposed on said cam roller means by said cylindrical drive means.

4,476,975

MONORAIL SUSPENDED CONVEYOR SYSTEM

Neal W. Densmore, Franklin, Pa., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Division of Ser. No. 80,760, Oct. 1, 1979, Pat. No. 4,339,031.
This application Dec. 23, 1981, Ser. No. 333,597
Int. Cl.³ B65G *21/10*
U.S. Cl. 198—864 **14 Claims**



1. Traction drive means for moving an elongated material conveyor along an overhead longitudinally extending rail, comprising:

(a) a traction drive unit cooperable with said overhead rail for movement therealong:

(b) elongated substantially rigid force transmitting means located in the proximity of and extending beyond the opposite ends of the longitudinal extent of said traction drive unit, said force transmitting means being connected to said conveyor for unitary movement; and

(c) link means interconnecting each respective opposite end of said traction drive unit to the one of the respective ends of said force transmitting means proximite to said respective traction drive unit end with one of said link means being in tension when said traction drive unit is driven in one direction to move said conveyor in said one direction and with the other one of said link means being in tension when said traction drive unit is driven in the opposite direction, the one of said link means not in tension being incapable of transmitting a driving force.

4,476,976

STENCILLING DEVICE

Dwight Smith, Harbor City, Calif., assignor to Marvin Elkins, San Diego, Calif.

Filed Apr. 19, 1983, Ser. No. 486,325
Int. Cl.³ B65D *25/08*; B32B *29/00*
U.S. Cl. 206—219 **11 Claims**

1. A compartment pouch for use in placing a fluid onto the surface of an object comprising:

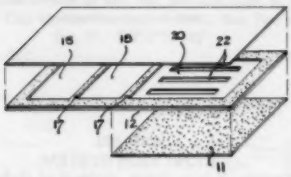
at least two sealed compartments formed in said pouch,

a breakaway partition forming a sealing separator between said compartments,

a first one of said compartments having a surface thereof stencilled to form an opening,

removable tape means placed on the stencilled surface, and a fluid placed in a second one of said compartments,

wherein when said second one of said compartments is squeezed, the pressure imparted to the fluid therein breaks the breakaway partition permitting the fluid to enter said



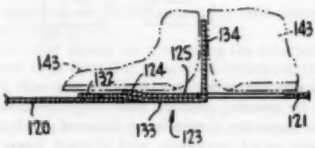
first one of said compartments, whereby with the tape means removed from the stencilled surface and the stencilled surface placed against the surface of the object to receive the fluid the fluid passes through the stencilled surface onto the surface of the object.

4,476,977

CLOSURE INTERLOCK FOR WRAP AROUND CARTONS AND INCLUDING SEPARATOR TABS

Guelfo A. Manizza, Blauvelt, N.Y., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Apr. 21, 1982, Ser. No. 370,557
Int. Cl.³ B65D *65/00, 75/00*
U.S. Cl. 206—434 **5 Claims**



1. A closure interlock for a closure panel assembly of a carton of the wrap around type, said closure interlock comprising an inner closure panel and an outer closure panel each having a free edge, said inner closure panel having struck therefrom a secondary locking tab carried by a flap with said secondary locking tab facing said free edge of said inner closure panel, the displacement of said secondary locking tab and said flap from said inner closure panel defining an opening in said inner closure panel having as a boundary thereof a primary locking shoulder, and said outer closure panel having a terminal flap portion in part defined by a fold line and in part by cut line means, said cut line means defining a primary locking tab carried by said terminal edge flap portion and facing away from said outer closure panel free edge for locking behind said primary locking shoulder, said secondary locking tab being connected to said secondary flap by a narrow neck portion defining a secondary shoulder on said inner closure panel and facing away from said primary locking shoulder, and a separator tab hingedly carried by said secondary flap.

4,476,978

DISC ACCOMMODATING CASE

Takashi Saito, Ayase, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 24, 1982, Ser. No. 381,490
Claims priority, application Japan, Jun. 1, 1981, 56-80735[U]
Int. Cl.³ G11B *5/82, 25/04;* **B65D** *85/30*
U.S. Cl. 206—444 **2 Claims**

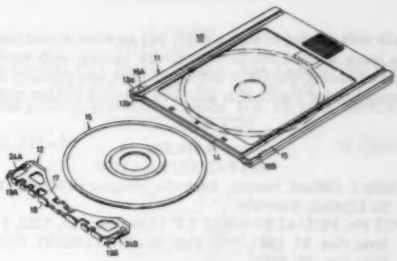
1. A disc accommodating case comprising a jacket having an opening at one end thereof for accommodating a disc recorded with an information signal within an internal space, and a lid member for closing the opening of the jacket accommodating the disc, said lid member comprising:

a lid main body which fits within the opening of said jacket;

a pair of engaging fingers provided on the right and left sides of said lid main body, for engaging with corresponding first depressions formed at the inner part of said jacket;

metal leaf spring arm members respectively fixed to said lid main body and supporting said engaging fingers at respective tip ends thereof, said metal leaf spring members capable of being bent resiliently along the width direction of said lid member, said leaf spring arm members having bases at their respective ends opposite said tip ends; and

said bases having rectangular plane configurations fixed to said lid main body, said bases having thicknesses smaller than the thickness of said lid main body,



root parts of said metal leaf spring arm members being fixed to said bases to constitute engaging arm assemblies together with said bases,

said engaging arm assemblies being symmetrical to the right and left with respect to a center plane along bending directions of said metal leaf spring arm members,

said lid main body comprising second depressions provided in the vicinity of the right and left ends on the same surface thereof,

said second depressions having rectangular contours corresponding to the rectangular plane configurations of said bases so that bases of said engaging arm assemblies closely fit into and become fixed with respect to said second depressions, and having depths of dimensions such that said engaging fingers lie on the same plane as said lid main body when said bases are fitted into said second depressions.

4,476,979

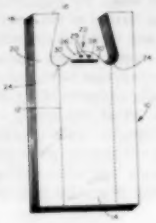
THERMOPLASTIC BAG PACK

George J. Reimann, Pittsford; Gordon L. Benoit, Macedon; James R. Gavin, Pittsford, and Michael A. Schneider, Hilton, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 3, 1983, Ser. No. 548,470
Int. Cl.³ B65D *1/34, 6/04*
U.S. Cl. 206—554 **10 Claims**

1. A bag pack comprising a plurality of stacked thermoplastic film bag structures each bag comprising a front and rear bag wall and an open mouth portion, said open mouth portion being characterized by having handles which are integral extensions of said walls, said handles being located at opposite ends of said mouth portion, the superimposed lines defined by said bag mouth opening in its lay-flat position are a series of compound curves including (a) stress relief curves at opposite ends of said bag mouth, said stress relief curves opening or facing in the direction of the handle end of the bag and (b) a curve intermediate said stress relief curves in said bag mouth opening, said curve being at least generally of the same but opposite amplitude as said stress relief curves; located within

the area beneath said (b) curve, but above the point of maximum amplitude of said (a) curves, is at least one orifice which serves to accommodate physical suspension of said bag pack



said orifice being of such a shape and location in said area so as to leave at least one comparatively narrow web serving to accommodate tear-off of individual bags, said plurality of bags being bonded together at said area adjacent to said orifice.

4,476,980

SPIRAL SEPARATOR

Philip J. Giffard, Nerang, Australia, assignor to Mineral Deposits Limited, Australia

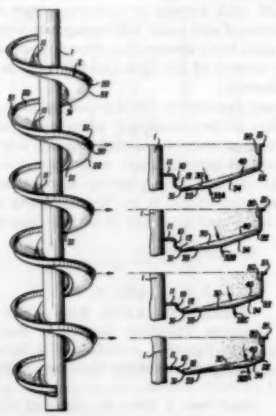
PCT No. PCT/AU82/00032, § 371 Date Nov. 17, 1982, § 102(e) Date Nov. 17, 1982, PCT Pub. No. WO82/03187, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 17, 1982, Ser. No. 444,895

Claims priority, application Australia, Mar. 18, 1981, PE8046

Int. Cl.³ B03B 5/52

U.S. Cl. 209—459 **28 Claims**



1. A spiral separator having at least a portion comprising a helical trough supported with its helical axis upright for separating a pulp of water and minerals flowing there down into mineral fractions of differing mineral density, said helical trough having an upwardly facing working surface, which, when viewed in vertical cross-section, is non-linear and is defined by a radial inner end, a radial outer end at a higher vertical location than said radial inner end and a point of maximum displacement between said ends, said point being located on said surface at a maximum spacing below a notional straight line joining said inner and outer ends;

the shape of the working surface profile varying from place to place lengthwise along the trough and the distance of the point of maximum displacement from the radial inner end of the profile also increasing lengthwise along the trough as at least a portion thereof is descended.

4,476,981

REJECTION SYSTEM

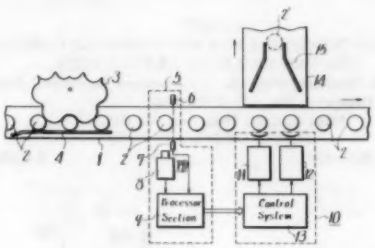
Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Japan

Filed Apr. 28, 1982, Ser. No. 372,660

Claims priority, application Japan, May 9, 1981, 56-69623

Int. Cl.³ B07C 5/36

U.S. Cl. 209—566 **4 Claims**



1. A product rejection system for use with an inspection system for rejecting products from a high speed conveyor, said product inspection system being disposed at a first location on said high speed conveyor, said product inspection system being effective for inspecting said products and for generating a product reject signal in response to a detection of a bad product, comprising:

means for sensing a first time each of said products enters said first location and for producing a product inspection position arrival signal;

first rejection means at a second location spaced a first predetermined distance downstream of said first location;

at least a second rejection means at a third location spaced a second predetermined distance downstream of said second location;

each of said rejection means including means for removing a selected one of said products from said conveyor;

a first timing means responsive to alternate ones of said product reject signals for producing a first enabling signal effective for actuating said first rejection means timed to occur at a second time following said first time, said second time occurring in coincidence with said product being positioned within an influence of said first rejection means; and

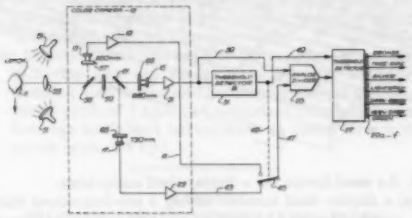
a second timing means responsive to other ones of said product reject signals for producing a second enabling signal effective for actuating said second rejection means timed to occur at a third time following said first time, said third time occurring in coincidence with said product being positioned within an influence of said at least a second rejection means whereby a higher rate of product removal from said high speed conveyor is achieved by alternate actuation of at least two rejection means than is possible with a single rejection means.

4,476,982

METHOD AND APPARATUS FOR GRADING ARTICLES ACCORDING TO THEIR SURFACE COLOR

Paul F. Paddock, Riverside; William G. Krage, Fair Oaks, and Tim D. Conway, Stockton, all of Calif., assignors to Sunkist Growers, Inc., Ontario, Calif.

Continuation-in-part of Ser. No. 249,820, Apr. 1, 1981, abandoned. This application Oct. 7, 1982, Ser. No. 433,245
Int. Cl.³ B07C 5/342
U.S. Cl. 209—582 14 Claims



1. Apparatus for grading the surface color of an article into one of a plurality of color grades, comprising:

means for measuring the reflectance of the surface of an article in each of three distinct wavelength bands, to produce first, second and third reflectance measurements;

means for computing the ratio of the first and second reflectance measurements to produce a first color ratio signal, and for computing the ratio of the first and third reflectance measurements to produce a second color ratio signal;

means for selecting one of the two color ratio signals in a prescribed fashion; and

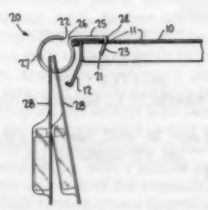
threshold detector means for comparing the selected color ratio signal to at least one prescribed threshold, the outcome of the comparison determining the appropriate color grade of the article.

4,476,983

SUPPORT HOOK AND ASSEMBLY FOR MERCHANDISING DISPLAY

Jacob Fast, 7561 NW. 9th St., Plantation, Fla. 33317

Filed Mar. 17, 1982, Ser. No. 358,868
Int. Cl.³ A47F 7/00
U.S. Cl. 211—57.1 8 Claims



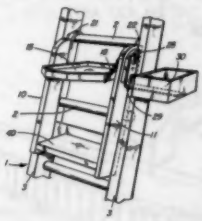
1. A support hook in combination with an apertured shelf for supporting apertured items for purposes of display forwardly of a generally downwardly projecting price molding edge of said apertured shelf, said shelf having a horizontal article supporting surface with a plurality of spaced holes defined therein, said support hook comprising an integral co-planar elongated rod-like member having first and second ends bent in a common plane to form a supporting portion and a mounting portion securing said member to said shelf with said common plane vertically oriented, said supporting portion projecting forwardly of said shelf, said mounting portion including said first end, said supporting portion including said secone end, said supporting portion being generally configured as a ring with a gap therein formed between said second end and said mounting portion, said gap being of sufficient size to permit said apertured items to be suspended from said ring by inserting said second end of said member through the apertured items, wherein said mounting portion includes a first section which projects downwardly through a hole in said shelf which is spaced rearwardly of said price molding edge, and a second section extending forwardly of said first section along and above said surface and terminating in said ring, wherein said first section and said ring are spaced by a distance which is substantially equal to the spacing between said hole and said price molding, and said hook being resilient in said common plane, whereby said hook resiliently engages said shelf between said first section and said ring.

4,476,984

STORAGE RACK

John S. Garrett, P.O. Box 72, Erskine, Alta, Canada T0G 1G0

Filed Feb. 18, 1983, Ser. No. 467,822
Claims priority, application Canada, Feb. 19, 1982, 396610
Int. Cl.³ A47F 5/00
U.S. Cl. 211—86 15 Claims



1. A storage rack adapted to be releasably attached to a ladder having two side rails spaced from one another at a given transverse spacing and a plurality of rungs, said storage rack comprising:

(a) two generally parallel elongate members spaced such that their external clearance is slightly less than the given transverse spacing of the respective ladder, said parallel members each having a generally rectangular cross-sectional configuration defined by an outer side surface, an inner side surface, a rear surface perpendicular to the side surfaces and a front surface opposed to the rear surface, said side surfaces being wider than the front and rear surfaces, so that, when the rack is attached to a respective ladder, said parallel members extend substantially parallel to the rails of the ladder, said rear surfaces rest against the respective rungs, and a part of one outer side surface protrudes forwardly beyond the respective rail of the respective ladder;

(b) attachment means fixedly secured to said part of at least one outer side surface, for securing to said part a supplementary device;

(c) a tray-like platform member pivotally secured to said two parallel members so as to pivot between a substantially vertical and a substantially horizontal position about an axis which extends generally perpendicularly between said two parallel members;

(d) hanger means having hook-shaped elements attached to one end of the parallel members at the rear surfaces thereof and curved rearwards away from the plane defined by the two rear surfaces, said hook-shaped elements being spaced from the opposite ends of the parallel members a distance in excess of the spacing between two adjacent rungs of the respective ladder; and,

(e) adjustment means for selectively adjusting the inclination of the platform member relative to the two parallel mem-

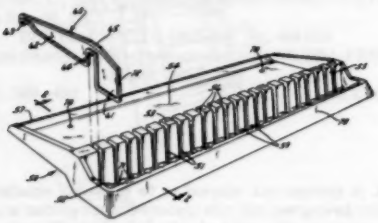
bers, said adjustment means including a hook-up means fixedly secured to one of said parallel members and an elongate connecting element fixedly attached at one end thereof to said platform member at a point proximate to said one parallel member, said elongate connecting member being engageable at a point thereof remote from said one end with said hook-up means, so as to adjust the inclination of the platform member relative to the two parallel members by selectively adjusting the effective length of said elongate connecting member, whereby the platform member can be arranged to extend generally horizontally at different angles of inclination of a ladder with which the rack is used.

4,476,985

SCREW AND BOLT TRAY DISPLAYER

Richard A. Norberg, and Ronald L. Selin, both of Rockford, Ill., assignors to Rockford Products Corporation, Rockford, Ill.

Filed May 18, 1981, Ser. No. 264,881
Int. Cl.³ A97F 3/14
U.S. Cl. 211—126 **5 Claims**



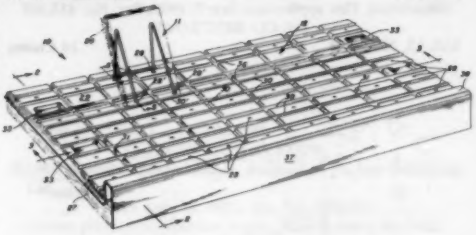
1. A display tray for attachment to shelving comprising an integrally formed member defining forward and rear compartments; said rear compartment comprising front, rear and side walls in the general form of a rectangle; an intermediate partition between and connecting said forward and rear compartments, said intermediate partition being in the form of an inverted channel having a front side and a back side, said forward compartment connected to said rear compartment in extending depending fashion and comprising front, rear and side inner walls in the general form of a rectangle, said forward compartment rear inner wall being formed by said intermediate partition front side; said intermediate partition having a plurality of horizontally spaced vertical slots; said inner front wall of said forward compartment having a like plurality of spaced vertical slots generally aligned with the slots in said intermediate partition; a plurality of dividers disposed in aligned pairs of said slots, wherein said dividers each comprise a front portion having a contour substantially the same as the inner contour of said forward compartment and dimensioned to fit into aligned pairs of said slots in said front wall of said forward compartment and in said intermediate partition, a back portion having a contour substantially the same as the inner contour of said rear compartment, connecting means integral with said back portion for attaching said back portion to said rear wall of said rear compartment, and a central portion connecting said front and back portions, which central portion defines a notch engageable with said intermediate partition; and means integral with said tray for securing said tray to a shelf.

4,476,986

EASEL DEVICE FOR DISPLAY SHELF

E. Montgomery Robinson, Chattanooga, Tenn., assignor to Atlas Paper Box Company, Chattanooga, Tenn.

Filed Oct. 1, 1981, Ser. No. 307,429
Int. Cl.³ A47F 5/00
U.S. Cl. 211—134 **8 Claims**



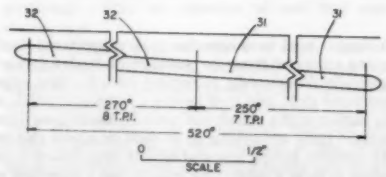
1. An easel device for a display shelf comprising:
(a) a display shelf member having a pre-determined thickness and having a plurality of peg-holes extending through said thickness of said shelf member, at least some of said peg-holes being uniformly spaced in a front-to-rear direction, said display shelf member having a substantially planar top surface,
(b) a body member having an upper portion and including downward diverging front and rear support members each having front and rear end portions, respectively,
(c) said front lower end portion being spaced forward of, and elastically yieldable relative to, said rear lower end portion,
(d) said front lower end portion comprising at least one front peg element projecting forwardly of said front support member, and said rear lower end portion comprising at least one rear peg element,
(e) said peg elements being adapted to depend through said corresponding front-to-rear spaced peg-holes to hold said body member in an upright operative position in which said front support member declines forward from said rear support member,
(f) a plurality of transverse ribs projecting upward from the plane of said top surface, each of said transverse ribs being spaced a pre-determined distance in front of a corresponding peg hole through which said front peg element depends, to support the bottom edge of a planar article between said front support member and said corresponding transverse rib member while said planar article is supported in a rearward inclined position on said front support member.

4,476,987

BOTTLE CAPS

Robert L. Nolan, Astoria, N.Y., assignor to Maxcap, Inc., New York, N.Y.

Filed Apr. 20, 1982, Ser. No. 370,041
Int. Cl.³ B65D 41/16
U.S. Cl. 215—319 **8 Claims**



2. A plastic bottle cap for a bottle of carbonated beverage

under pressure said bottle having a neck carrying an outwardly extending thread, said cap comprising:

a top wall,

an annular sidewall extending down from said top wall and having an inwardly extending thread for cooperation with said neck thread, said sidewall and said top wall meeting at a corner,

a gasket held below said top wall in a position to be compressed against said top wall by engagement with the top of said bottle when the cap is screwed onto said neck,

the improvement wherein

said cap thread has a lower reach in which the thread pitch is about 7 turns per inch and an upper reach in which the thread pitch is about 8 turns per inch,

the lengths of said reaches and the cap dimensions being such that said cap fits securely on both a standard threaded glass carbonated beverage bottle neck having a thread pitch of 7 t.p.i. and a standard plastic carbonated beverage bottle neck having about 1¼ thread turns with a thread pitch of 8 t.p.i.

4,476,988

STORAGE AND TRANSPORT CONTAINERS

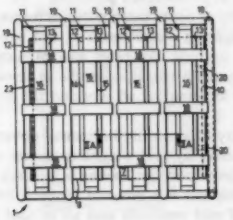
Nicholas J. Tanner, Poole, England, assignor to Wes Ltd., Parkstone, United Kingdom

Continuation-in-part of Ser. No. 187,999, Sep. 17, 1980, abandoned. This application Mar. 21, 1983, Ser. No. 477,427

Claims priority, application United Kingdom, Sep. 20, 1979, 7932572; Jun. 13, 1980, 8019371

Int. Cl.³ B65D *6/34, 57/00, 88/10;* **F42B** *37/02*

U.S. Cl. 220—1.5 **10 Claims**



1. A storage and transport container for elongate articles comprising: a member of generally honeycomb section defining a plurality of elongate recesses, five walls forming a parallelipipedal box with one open side and surrounding said member of honeycomb section, spacer members secured to the outer faces of said side walls, tie bars secured to said spacer members, protective hoops encircling said box and secured to said tie bars so that each tie bar extends between an adjacent pair of said hoops; and a door serving to close and seal said open side of said box; said spacer members being of elongate configuration, each of top hat section with two flanges forming a brim of the top hat section welded to said walls of said box; said tie bars extending perpendicularly to said elongate spacer members and to said hoops, with a middle portion of each of said tie bars welded to a web of the respective top hat section spacer member which forms a crown thereof and with the ends of each tie bar welded to respective ones of two adjacent ones of said hoops.

6. The storage and transport container claimed in claim 1, wherein said door comprises a panel with sealing means adjacent its periphery to engage said box adjacent said open side thereof, a framework located on the exterior face of said panel, at least one linkage located between and connecting said panel and said framework and a plurality of compression springs extending between said panel and said framework, said framework being engageable at opposite site sides thereof with said box such that the force springs presses said panel away from said framework toward said box, said linkage can be expanded to seal said panel around said open side of said box, and said linkage can be contracted to pull said panel outwardly toward said framework to break the seal.

9. A storage and transport container for elongate articles comprising a member of generally honeycomb section defining a plurality of elongated recesses, five walls forming a parallelipipedal box surrounding said member of honeycomb section, elongated spacer members, each of top hat section with two base flanges forming a brim of said top hat section spot-welded to a wall of said box, said top hat section further comprising side flanges secured to said two base flanges and a crown flange secured to said side flanges; tie bars secured to said crown flanges of said spacer members, protective hoops encircling said box and secured to said tie bars, and a door to close and seal said open side of said box.

4,476,989

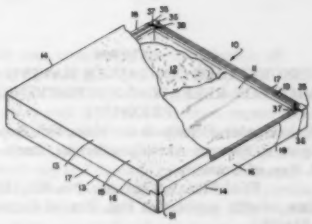
PIZZA BOX CARTON

Arthur Larsen, 1 Pitt Pl., Dix Hills, Long Island, N.Y. 11746

Filed Dec. 28, 1981, Ser. No. 335,166

Int. Cl.³ B65D *1/24;* **A45C** *11/20*

U.S. Cl. 220—4 E **5 Claims**



1. A carton comprising a pair of interchangeable, opposed, closure members, each of said closure members comprising a rectilinear base and four side walls disposed at the periphery of said base so as to provide a four-cornered construction being formed with central receptable portion, wherein first two of said walls being formed with lip portions and the second two of said walls being formed with other lip portions, said first two walls being oppositely disposed and said second two walls being oppositely disposed, wherein the lip portions of said first two walls are more outwardly disposed than the lip portions of said second two walls, said corners comprise upwardly-extending lip portions, and wherein said corner portions of one member interfit the corner lip portions of the other member, said corner lip portions of opposed closure members being in abutment, and wherein said corner lip portions extend upwardly about one-half the height of the side lip portions; said interfitting side lip portions and said abutting corner lip portions forming a step at the line of closure of the members at each of the side walls of the carton adjacent the corner, and wherein one step is more upwardly disposed than the other step, whereby the two closure members are interfitted with the lip portions of said first walls interengaging the other lip portions of said second two walls of the opposed closure members.

4,476,990

SLIP AND SKID RESISTANT REEL CARRIER

Robert A. Basili, Waldwick, N.J., assignor to Plastic Reel Corporation Of America, Elmwood Park, N.J.

Filed Apr. 29, 1982, Ser. No. 373,415

Int. Cl.³ B65D *1/40*

U.S. Cl. 220—83 **3 Claims**

1. A substantially slip and skid resistant container for storing, carrying, and shipping reels of motion picture film, videotape, magnetic tape and the like, said container comprising an open top box formed of a unitary piece of molded plastic material having a substantially flat bottom wall and upstanding periph-

eral side wall, said bottom wall being sized and shaped to receive the flat side of a reel thereon in substantially concentric relation; a separable fitted cover for said open top box formed of a unitary piece of molded plastic material having a substantially flat top wall shaped to conform to the open top box; and means for securing said open top box and said cover together, said open top box and said cover each being formed from a polymer blend molding composition comprising from about 75% to 85% by weight high density polyethylene and from about 15% to 25% by weight of a thermoplastic elastomer which comprises styrene-butadiene-styrene block copolymer, by weight of the overall composition, whereby said thermoplastic elastomer in said polymer blend molding composition provides a sufficiently high coefficient of friction to said container to render said container substantially slip and skid resistant when used on conveyer belts.

4,476,991

PRESSURIZABLE CONTAINER HAVING A SAFETY DEVICE FOR RELEASING EXCESSIVE CONTAINER PRESSURE

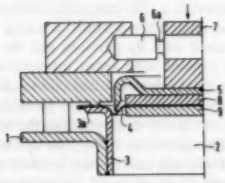
Kurt Voigtländer, Offenbach am Main, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 588,019

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310782

Int. Cl.³ F16K *17/16*

U.S. Cl. 220—89 A **11 Claims**



1. A pressurisable container having a pressure release outlet, a rupturable closure element closing said outlet, a cutting device arranged to rupture the closure element when a predetermined maximum pressure in the container is exceeded, a rigid retaining device which holds the cutting device in a position out of engagement with the closure element when the container pressure is less than the predetermined maximum pressure, and a predetermined weakening provided on the retaining device which breaks when the predetermined maximum pressure is exceeded so as to allow the cutting device to move under the action of the pressure in the container so as to rupture the closure element, comprising:

(a) the retaining device rigidly connected to the cutting device;

(b) the cutting device rigidly connected to a first plate; and

(c) the closure element clamped between the first plate and a second plate to define a rupturable rim of the closure element to be engaged by a cutting edge of the cutting device,

wherein the retaining device, the cutting device and the first plate are arranged on the side of the closure element which faces the interior of the container.

4,476,992

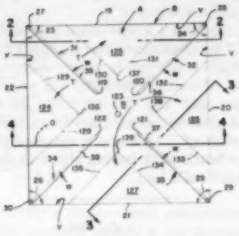
RESERVOIR COVER WITH TENSIONED PLATES

Dennis H. Gerber, Los Gatos, Calif., assignor to Burke Industries, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 332,972, Dec. 21, 1981, abandoned. This application Sep. 28, 1982, Ser. No. 425,556

Int. Cl.³ B65D *88/38*

U.S. Cl. 220—219 **12 Claims**



1. A tensioned reservoir cover for placement upon the fluid surface of an open reservoir comprising:

a. a flexible cover member of substantially fluid impervious material of sufficient area to cover the sidewalls and bottom of said reservoir when empty;

b. means connecting the perimeter of said cover member to the perimeter of said reservoir;

c. weighting means positioned with respect to said cover member at pre-selected positions;

d. a plurality of cover sump portions formed in said cover by said weighting means, each of said sump portions being defined, narrow, elongated and interconnected and having generally vertical sidewalls in tension and having a selected location for all working fill levels of said reservoir;

e. a plurality of generally horizontal cover portions formed in said cover by said weighting means, each of said horizontal cover portions having a selected geometric shape and positioned at a selected location for all working fill levels of said reservoir and all of said horizontal cover portions are in tension in at least two different horizontal directions of sufficient magnitude to permit workmen to traverse all portions of said horizontal cover portions for all working fill levels with said horizontal cover remaining substantially planar in sustaining the weight of the workmen; and

f. said horizontal cover portions are bordered by said reservoir perimeter and said sump portions and cover substantially all of the surface of said reservoir for all working fluid level conditions.

4,476,993

TAMPERPROOF LID

Gerald R. Krout, Rte. 1, Box 198A, Sawyerville, Ala. 36776

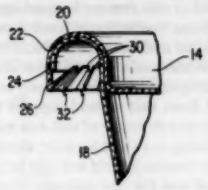
Filed Oct. 6, 1983, Ser. No. 539,414

Int. Cl.³ B65D *17/40*

U.S. Cl. 220—276 **14 Claims**

1. A tamperproof container closure comprising: a cover having an outer periphery; tear strip means detachably connected to said cover at said outer periphery thereof to be torn therefrom when the cover is to be removed from a container, said tear strip means having an outer edge portion with a plurality of toothed segments attached to and extending along

said outer edge portion, said toothed segments being formed so as to extend generally inwardly and upwardly from the location at which they are attached to said outer edge portion of the tear strip means.

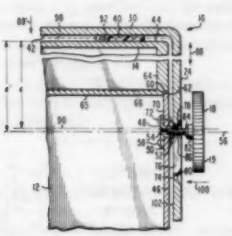


4,476,994

LID LATCHING APPARATUS

George P. Hope, Lancaster, Pa., and Randy D. Rhodes, Frenchtown, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 13, 1983, Ser. No. 484,525
Int. Cl.³ B65D *45/00*
U.S. Cl. 220—318 8 Claims



1. A lid latching apparatus comprising:

a housing having a threaded hole concentric about a first axis;

a lid member releasably secured to the housing;

a lid latching handle for locking the lid member to the housing and for carrying said housing and lid in one orientation of the handle, said handle including one leg portion that overlies the lid and engages the lid when moved to a locking position and a second leg portion generally normal to said one portion and positioned adjacent to a housing side, said second leg portion having an aperture with a conically tapered side wall, said aperture having a second axis parallel to the first axis, said one leg portion including means which normally offsets said second axis out of alignment with said first axis when the handle is unlocked; and

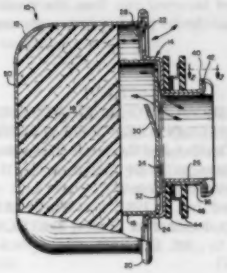
a handle locking hand screw including a shaft passing through said aperture including a conical shoulder section engaged with said conically tapered side wall and a threaded stud section concentric with said shoulder in engagement with said threaded hole, said second leg portion being between said shoulder and housing, said shoulder when moved parallel to said first axis by further engagement of said stud section in said hole tending to align the axes placing said one leg portion in said lid locking position, whereby wedging the handle in place and securing the lid member to the housing.

4,476,995

BREATHER CAP

Ralph R. Bellino, Brunswick, and Charles W. McVey, Chardon, both of Ohio, assignors to American Industries, Cleveland, Ohio

Filed Oct. 20, 1981, Ser. No. 313,191
Int. Cl.³ B65D *51/16*
U.S. Cl. 220—371 8 Claims



1. A breather cap, comprising the combination of:

a top housing including a filter element;

a base secured to said top housing, said base comprising a throat portion and twist-on connection means formed in said throat portion, said base and top housing cooperating to define means for reversibly conducting gaseous fluid through said cap and through said filter element;

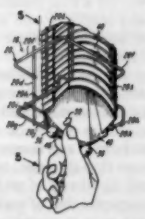
and a sleeve member assembled on said throat portion, said twist-on connection means comprising finger means extending radially outwardly of said throat portion and said sleeve member, and said finger means being formed in said throat portion and in said sleeve member such that the ends of said sleeve member in said finger means extend radially outwardly further than the corresponding parts of said throat portion in said finger means.

4,476,996

RETAINER AND DISPENSER FOR FOOD CONTAINERS IN FAST FOOD ESTABLISHMENT

Franklin Moore, Jr., 902 McBurney Dr., Lebanon, Ohio 45036, and Clinton Fultz, 508 Preston Dr., Waynesville, Ohio 45068

Filed Feb. 12, 1982, Ser. No. 348,350
Int. Cl.³ B65H *1/00*
U.S. Cl. 221—61 3 Claims



1. A dispenser for folded paperboard open top cups each including a back panel having a projecting lip portion extending beyond a front panel to form a scoop for a food product adapted to be sold in a fast-food establishment, said dispenser comprising a series of spaced vertical wires rigidly connected by a series of horizontal cross wires to form an open top wire housing for receiving a stack of the cups arranged in inverted nested relation, the wires forming a rear surface of the housing for mounting of the housing on a wall, a pair of vertical stack

guide wires spaced forwardly from the rear surface of the housing to define a finger space between the back panels of the stack of nested cups and the rear surface of the housing, a pair of enlarged abutment members secured to the lower end portions of the vertical guide wires, the abutment members being positioned to form a stop for the projecting lip portion of the back panel of the lowermost inverted cup in the stack to retain the stack of cups within the wire housing, and the abutment members have front guide surfaces providing for the removal of the lowermost inverted cup from the stack in response to manual flexing of the lip portion forwardly around the guide surfacs.

4,476,997

AUTOMATIC DEVICE TO DISTRIBUTE, ORIENT AND POSITION AXES ON MACHINES

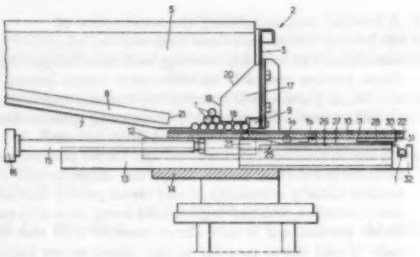
Marc Lacroix, Viroflay, and Raymond Bienvenu, Thiais, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jun. 9, 1982, Ser. No. 386,519

Claims priority, application France, Jun. 10, 1981, 81 11434

Int. Cl.³ B65G *47/24*

U.S. Cl. 221—171 **6 Claims**



1. An apparatus for separating, orienting and positioning cylindrical axes, each of said axes having a flat on the cylindrical surface thereof, said apparatus comprising:

a fixed chute having front and side walls and having a bottom opening;

means for supplying a plurality of said axes to said chute such that said axes extend in a first direction parallel to said front wall and in a horizontal plane;

a drawer closing said bottom opening;

guide means inside said chute and fixed to said front wall, said guide means having a lower edge vertically spaced from said drawer by a first distance equal to at least one axis diameter and less than two axis diameters, whereby only one row of said axes may be positioned adjacent the bottom of said front wall;

means for moving said drawer in a second direction between a first and a second position, wherein said second direction is horizontal and transverse to said first direction, wherein in said first position a distal end of said drawer is positioned below said chute and horizontally spaced from said front wall by said first distance, and wherein said in second position said distal end of said drawer is on a side of said front wall opposite that of said first position, whereby only one of said axes is permitted to fall through said bottom opening only when said drawer is in said first position;

first support blades extending in said second direction from said first position towards said second position, said first support blades being located at a first location, not including the location of said flat, along said first direction, whereby an axis which has fallen through said bottom opening is supported for rolling movement on said first support blades as said drawer is moving towards said second position;

second support blades extending in said second direction from said first support blades towards said second position, one of said second support blades being located at a second location along said first direction;

push means fixed to said drawer for pushing said axis as said drawer is moving towards said second position; and

trap means fixed to said distal end of said drawer, said trap means being horizontally spaced from said push means in said second direction by approximately one axis diameter, being spaced from said second support blades by a distance equal to said diameter of said axis minus the depth of said flat and being in a third location along said first direction, whereby rotation of said axis can be prevented by the cooperation of said flat and said trap means.

4,476,998

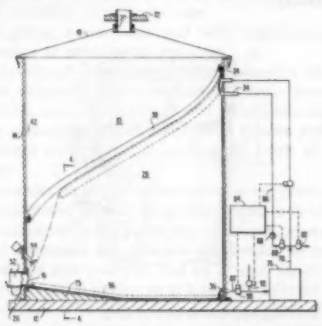
SIDE UNLOADING BIN FOR STORING AND DISCHARGING FREE-FLOWING GRANULAR MATERIAL

Timothy C. Bonerb, and Vincent C. Bonerb, both of P.O. Box 2016, Buffalo, N.Y. 14219

Continuation-in-part of Ser. No. 257,604, Apr. 27, 1981, Pat. No. 4,421,250, which is a continuation-in-part of Ser. No. 307,089, Sep. 30, 1981,. This application Mar. 12, 1982, Ser. No. 357,592

Int. Cl.³ B65D *88/62*

U.S. Cl. 222—61 **8 Claims**



1. A side unloading bin for storing and discharging free-flowing material, supported on a floor capable of supporting the weight of the material stored in the bin, the bin comprising:

(a) bin side walls secured to and upstanding from the floor,

(b) discharge means for discharging material through the bin side wall means at a discharge area near the bottom thereof,

(c) a flexible, inflatable, generally cup-shaped, slanted top, double-walled bag having its bottom resting on the floor, its sides normally adjacent and inside the bin side wall means, and having a discharge opening therethrough, the discharge opening located coextensive with the discharge area in the bin side wall, the top walls of the cup-shaped bag being attached to the inside of the bin side wall means in a continuous manner by clamp means from an area slightly above the discharge area on one side of the bin to a higher level on the other side of the bin,

(d) the walls of the cup-shaped bag being sealed together to prevent separation in an area extending from the discharge opening and flaring outwardly and upwardly to the area slightly above the discharge opening where the bag is sealed to the side wall,

(e) means for inflating the bag to cause the free-flowing granular material to flow by gravity through the bag discharge opening.

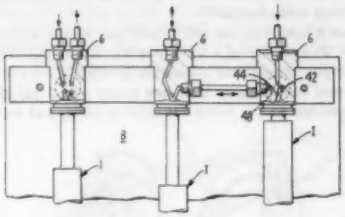
4,476,999
AUTOMATED LIQUID DISPENSER

Robert A. Bilbrey, Orinda, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 297,955, Aug. 31, 1981, abandoned, which is a continuation-in-part of Ser. No. 285,516, Jul. 21, 1981, abandoned. This application Jan. 12, 1984, Ser. No. 570,277

Int. Cl.³ B67D *5/14*

U.S. Cl. 222—75 7 Claims



1. An automated liquid dispenser comprising:
a frame;
at least one demountable precision metering syringe mounted on the frame;
a motor driven syringe actuator for each metering syringe;
valve means for selectively connecting the cylinder of each metering syringe to one of a sample probe, reagent reservoir, atmosphere or another syringe cylinder;
a valve actuator for selecting the position for each valve;
a sample probe carrying electrical switch means for controlling the valve actuator; and
a microprocessor controlled for the syringe and valve actuator programmed in response to a preselected sequence of operating commands.

4,477,000
APPARATUS FOR FORMING PORTIONS OF SOAP FOAM

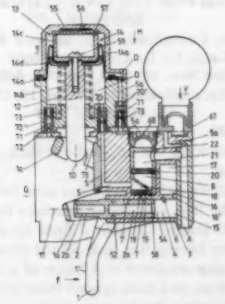
Sandro Arabian, Vaduz, Liechtenstein, assignor to Europtool Trust, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 142,003, Apr. 21, 1980, Pat. No. 4,349,131. This application Feb. 1, 1982, Ser. No. 344,541

Claims priority, application Switzerland, May 10, 1979, 4367/79; Nov. 18, 1981, 7399/81

Int. Cl.³ B67D *5/42, 5/54*

U.S. Cl. 222—135 5 Claims



1. An apparatus for forming portions of foamed soap lather, comprising:
a supply container for an aqueous soap solution;
means defining a soap solution-dosing pump cooperating with said supply container;
means defining a compressed air-membrane pump cooperating with said dosing pump;
a single actuation lever for actuating said soap solution-dosing pump and compressed air-membrane pump;
said membrane pump containing a membrane piston;
return spring means cooperating with said membrane piston;
a mixing chamber for forming soap foam cooperating with said soap solution-dosing pump and said compressed air-membrane pump; and
said compressed air-membrane pump being structured as a double-acting membrane pump.

4,477,001
VALVE FOR PRESSURIZED CONTAINER

Karl Galia, Öhningen, Fed. Rep. of Germany, assignor to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

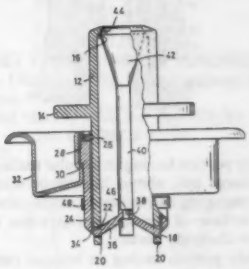
PCT No. PCT/DE80/00181, § 371 Date Aug. 11, 1981, § 102(e) Date Aug. 11, 1981, PCT Pub. No. WO81/01696, PCT Pub. Date Jun. 25, 1981

PCT Filed Dec. 5, 1980, Ser. No. 293,207

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1979, 2949666

Int. Cl.³ B65D *83/14*

U.S. Cl. 222—402.1 16 Claims



1. A valve for pressurized dispensing containers, with a closing member which is movable towards a valve seat and engages thereon in its rest position or closing position, characterized by
(a) a bushing (24) fixedly insertable into the container,
(b) a sliding sleeve (12) slidably guided in the bushing which at its upper end is provided with the valve seat (16) and at its lower inner end with recesses (18),
(c) a plurality of arms (36) each being connected with the bushing (24) through respective joints (34) and extending radially therefrom and being guided to the inside through one of the recesses (18), and
(d) a rod (40) disposed centrically and slidable within the bushing (24) and the sliding sleeve (12) and which on its upper end is provided with the closing member (42) and is connected at its lower end with the inner radial end of the arms (36), wherein the joints (34) and the adjacent areas of the bushing (24) are elastic in such a manner that the displacement of the outer ends of the arms (36) in a radially outwardly direction, which displacement is produced by a downward movement of the sliding sleeve sleeve (12), is reversible.

4,477,002
DISPENSING CAP CONSTRUCTION

Gene Stull, 5 Oak St., Chester, N.J. 07930

Filed Aug. 3, 1982, Ser. No. 404,768

Int. Cl.³ B67D *5/06*

U.S. Cl. 222—521 15 Claims

1. A compact cam-advance, thread-retract dispensing stop-

per cap construction of short axial dimension, comprising in combination:

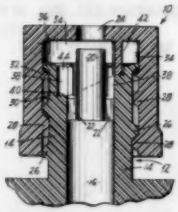
(a) an elongate tubular body portion having exterior and interior annular walls, and having a discharge passage extending through it,

(b) said body portion having a stopper plug disposed in said passage and projecting from its discharge end,

(c) support means extending between the interior annular walls of said body portion and the stopper plug, to mount the latter,

(d) said body portion having an annular space in its interior annular wall at its discharge end, said space being disposed between its interior annular wall and the stopper plug, and having external screw threads on its exterior annular wall,

(e) a screw cap having a top wall, said screw cap being carried by the tubular body portion and having internal screw threads for engagement with the external screw threads of said body portion, and having an annular interior sealing surface located adjacent said top wall above said screw threads and disposed radially outward of and surrounding said body portion,



(f) said body portion having an annular sealing bead adjacent the discharge end, above its exterior screw threads and slidably engaging and movable axially along said interior sealing surface of the screw cap when the cap moves axially on the body portion,

(g) said body portion having an internal curved cam track constituting a drive ramp, located in the discharge end portion of its inner annular wall, in the said annular space thereof, and having its uppermost part extending above the external screw threads of the body portion and adjacent to the top wall of the screw cap when the screw cap is screwed down on the body portion, said annular sealing bead surrounding said cam track,

(h) said screw cap having a cam follower lug carried by said top wall and extending into the annular space of said body portion and engaging the curved cam track thereof, and having a discharge orifice in its top wall, which is closed by said stopper plug when the cap is screwed down on the body portion under the action of said screw threads,

(i) the unscrewing movement of the cap causing it to be forcibly raised axially on the body portion to open the orifice thereof, under the action of the follower lug riding on the curved cam track.

4,477,003

CONDIMENT DISPENSING SYSTEM

Forrest E. Baker, San Jose, and Norman D. Sullivan, Hollister, both of Calif., assignors to Automated Portion Control Technology, Inc., Hollister, Calif.

Filed Feb. 3, 1982, Ser. No. 345,288

Int. Cl.³ B67D *5/02*; G01F *11/00*

U.S. Cl. 222—642 **7 Claims**

1. Apparatus for dispensing condiments, and the like, comprising, in combination:

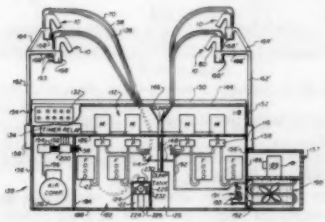
(a) gun means arrangeable for dispensing a measured quantity of substance, including in combination,

(1) a housing having a first portion defining a chamber for receiving said measured quantity,

(2) motor means mounted in a second portion of said housing and having a piston and a rod affixed to the piston, the piston and the rod being slideably disposed in said chamber, and a fluid motor attached to the rod and arranged for selectively reciprocating the rod and the piston for selectively discharging said measured quantity from said chamber, and

(3) trigger means connected to said motor means for selectively actuating said motor means for reciprocating the rod and the piston disposed in said chamber which selectively causes discharge of said measured quantity from said chamber;

(b) pump means connected to said gun means and connectable to a supply of a substance for selectively feeding to said gun means said measured quantity from the supply thereof including at least one pump and a pump motor connected to the pump for driving same, and time relay



control means arranged for communication with said gun means and connected to the pump, responding to a signal indicative of said trigger means being released from a dispensing mode;

(c) flow means connected to said chamber by a discharge opening and said pump means, placing said gun means and pump means in communication with one another and with said supply, the flow means arranged for transmitting the signal from said gun means, actuating said pump means, and feeding said gun means said measured quantity from said supply only when said trigger means is released from the dispensing mode, and includes connector means for releasable attachment to a container of said supply, and cleaning means to which said connector means is attachable alternately with attachment to the container of said supply of substance for periodically cleaning said flow means.

4,477,004

PARCEL RACK FOR USE ON A VEHICLE SUCH AS A BICYCLE

Giovanni Barro, Conegliano, Italy, assignor to Fratelli Barro, Giovanni E Luigi, S.r.L., Conegliano, Italy

Filed Nov. 10, 1982, Ser. No. 440,746

Claims priority, application Italy, Nov. 19, 1981, 34051/81[U]

Int. Cl.³ B62J *7/04*

U.S. Cl. 224—39 **3 Claims**

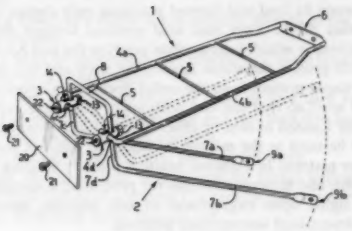
1. A parcel rack for use on a vehicle such as a bicycle, said rack comprising:

a frame structure defining a planar area for supporting parcels and the like, said frame structure comprising a substantially U-shaped member defined by a pair of laterally spaced arms having first ends joined by means for attaching said frame structure to a frame of a vehicle such as a bicycle and second ends spaced from said first ends;

a bracing structure for bracing said frame structure with respect to the vehicle frame, said bracing structure comprising a substantially U-shaped element including a pair of bar members having first ends connected by a transverse section and second ends for connection to the vehicle frame, said bar members, at positions adjacent said

transverse section, being bent to form respective straight portions which are coplanar; and

attachment means for removably connecting said bracing structure to said second ends of said arms in a manner such that said bracing structure may be removed from connection to said frame structure, such that said bracing structure may be fixed to said frame structure at varying positions spaced generally along said bar members of said bracing structure, and such that said bracing structure may be rotated with respect to said frame structure to extend in varying directions therefrom, said attachment means comprising a pair of units, each said unit having therethrough first and second orthogonal holes which partially intersect each other and a third hole perpendicular to and intersecting said second hole, said second ends



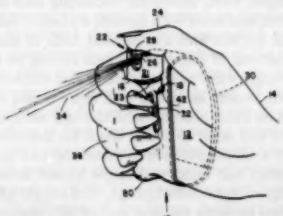
of said arms of said frame structure having laterally inwardly extending shaft sections extending through said first holes of respective said units, said straight portions of said bar members of said bracing structure extending through said second holes of respective said units, such that said bar members and said units are rotatable with respect to said frame structure about said shaft sections, thereby to vary the angular relationship between said frame structure and said bar members, and such that said bar members of said bracing structure are axially movable within said second holes, thereby to vary the relative positional relationship between said frame structure and said bar members, and clamping means on each said unit for fixing the respective said shaft sections and bar members at particular angular and positional relationships of said frame structure and said bar members.

4,477,005

PORTABLE, HAND-MOUNTABLE DEFENSE WEAPON SYSTEM

Louie Martinez, P.O. Box 34943, San Antonio, Tex. 78233

Filed Jun. 11, 1982, Ser. No. 387,593
Int. Cl.³ B65D *85/20*
U.S. Cl. 224—218 **1 Claim**



1. A portable, hand-mountable, defense weapon system comprising:

(a) a flexible carrier means having a singular open pocket with an opening extending laterally across less than the full width of a first surface, said first surface above a second independent surface, said surfaces joined together along the edges of said surfaces, said surfaces having said pocket formed therein at a generally middle location between said surfaces, said first surface having adapted thereto adjacent one end of said first surface a first portion of a complimentary fastening means adapted to be releasably engaged with a corresponding second portion of said complimentary fastening means adapted adjacent an opposite end of said second surface, wherein upon engagement of said first portion with said second portion said system is securely retained in place on a user's hand;

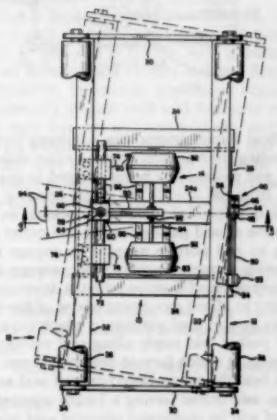
(b) an aerosol container of tear gas propellant having a cylindrical body portion sized to be securely retained within said pocket without the aid of any attachment means during movement of said system, said container having a cylindrical cap member being larger in diameter than said cylindrical body portion of said container, said container further having a discharge means in said cap extending above said opening in said pocket when said container is disposed within said pocket, said discharge means further being juxtaposed to the thumb of said hand such that said thumb may operatively engage said discharge means discharging said gas away from said hand when said complimentary fastening means is engaged, securely retaining said system on said hand.

4,477,006

OFFSET PIVOT GUIDING ASSEMBLY

Mark E. Sharp, Oklahoma City, Okla., assignor to Robert L. Fife, Vancouver, Wash.

Filed Mar. 3, 1983, Ser. No. 471,763
Int. Cl.³ B65H *25/26*
U.S. Cl. 226—18 **10 Claims**



10. An offset pivot displacement-type guiding assembly for controlling the path of travel of a web comprising

a base frame,

a guide frame overlying said base frame,

said guide frame having lateral frame means supporting a pair of spaced, parallel guide rollers which are arranged with their axes extending across the line of travel of said moving web and which receive the traveling web over the surface thereof from an entering span at one of said rollers and an exiting span at said other roller, the span between said rollers comprising a guide movement span,

a fixed offset pivot mounted on said base and having a flexible arm extending laterally from said pivot and secured adjacent its outer end to said guide frame adjacent to the

entering span of said rollers for pivotally supporting said guide frame,

a moving pivot assembly disposed adjacent to the exiting span of said rollers,

said moving pivot assembly comprising a laterally extending support shaft mounted on said base frame for linear movement,

said moving pivot assembly also comprising projection means integral with said guide frame, a pivot shaft pivotally supported in said projection means and depending from said projection means,

means securing said pivot shaft to said support shaft whereby said projection means is restricted to linear movement, the relative travel between the linear movement thereof and the arc of said fixed pivot being absorbed by a flexing of said arm,

and actuator means on said base frame secured to said pivot shaft for driving said support shaft to provide pivot adjusting movement of said guide frame.

4,477,007

STAPLER WITH INTERMEDIATE LATCHING MECHANISM

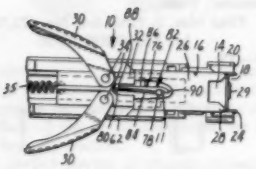
Floyd L. Foulen, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 234,999, Feb. 17, 1981, abandoned. This application Oct. 11, 1983, Ser. No. 540,112

Claims priority, application Sweden, Feb. 22, 1980, 8001387

Int. Cl.³ B25C *5/02*; A61B *17/04*

U.S. Cl. 227—19 **2 Claims**



1. In a medical stapler comprising a housing having a passageway extending from an inlet opening to an outlet opening, said openings and passageway being adapted to guide a single staple moved from the inlet to the outlet opening; means for biasing a stack of staples into said inlet opening; an anvil projecting transverse of said passageway at said outlet opening; a driver having an end portion adapted to engage one of the staples and being mounted within said passage for sliding movement between a load position with the driver spaced from the inlet opening to afford movement of one of the staples into the passageway, to a formed position to which the end portion of said driver pushes said staple along said passageway from said inlet opening, at which formed position the end portion of the driver has bent the staple closed around said anvil at said outlet opening, said driver having a length adapted so that a portion thereof will be positioned adjacent said inlet opening during movement of said driver from its load to its formed position to prevent movement of another of said staples into said passageway through said inlet opening; drive means including a driver member and being activatable to move said drive member away from an initial position to move said driver along said passageway, thereby moving one of the staples from said inlet opening through said passageway and to said outlet opening; return means for returning said drive member to its start position after it has moved said driver to its formed position; and coupling means for coupling said drive member and said driver together after said drive member has moved said driver to said formed position so that said driver will be moved back to its load position when said return means returns said drive member to its initial position, said coupling means comprising a first lug fixed to said driver; a second lug; means for supporting said second lug on said drive member for movement between an engage position at which said second lug will engage said first lug to couple said driver with said drive member when said drive member is closely adjacent said driver, and a release position with said lugs separated to afford separation of said driver and said drive member; and cam means for maintaining said lug in said release position during movement of said drive member to move said driver from its load toward its formed position, for moving said lug to its engage position after said drive member has moved said driver to its formed position, and for subsequently maintaining said lug in its engage position as said drive member returns to its initial position to pull said driver from its formed to its load position; the improvement wherein said cam means has a notch for receiving said first lug to provide latching means for stopping movement of the end portion of the driver away from said anvil at a predetermined intermediate position of said driver between its load and formed positions only during movement of said driver from said load position toward said formed position, at which intermediate position the end portion of the driver presses the staple against the anvil and end portions of the staple project from the outlet opening on opposite sides of said anvil so that the end portions of the staple can be accurately located in skin or other material to be stapled, and can also be used in the manner of hooks to position such skin or other material in a desired position prior to bending the staple closed; and to provide means for producing a distinctive audible signal upon engagement of said latching means at said predetermined intermediate position.

4,477,008

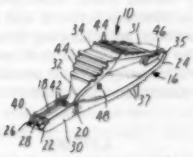
STAPLER

Kent R. Struble, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 299,068, Sep. 3, 1981, abandoned. This application Nov. 18, 1983, Ser. No. 552,025

Int. Cl.³ A61B *17/04*

U.S. Cl. 227—19 **12 Claims**



1. A stapler adapted for joining living tissue, said stapler comprising an elongate body having front and rear ends, a guide surface adjacent said front end, and an anvil transversely centered at said front end projecting at a right angle to said guide surface; an open staple having a generally planar side surface and pointed ends; means for mounting said staple on said body adjacent said anvil with the side surface of said staple along said guide surface and the pointed ends of said staple adjacent the front end of said body; a ram having an end surface adapted to engage the edge surface of said staple opposite said pointed ends; means mounting said ram on said body for movement from an open position with the end surface of said ram spaced from said anvil to afford space for the open staple therebetween to a closed position to cause the end surface of said ram to engage and bend said staple closed around said anvil; only a single toggle joint linkage, said toggle joint linkage being attached between the rear end of said body and said ram with the axes of pivotal movement of said toggle joint linkage parallel to said guide surface so that said toggle joint linkage projects from said body in the open position of said ram and is manually movable toward said body to move said ram to its closed position; and means on the side of said body opposite said toggle joint linkage for affording manual gripping of said

body during manual movement of said toggle joint linkage toward said body.

4,477,009

TUNGSTEN CARBIDE REACTIVE PROCESS

Richard M. Walker, 5735 Warrenshire, Bloomfield, Mich. 48033

Filed Mar. 8, 1982, Ser. No. 356,104
Int. Cl.³ B23B *1/20*; B23P *6/04*
U.S. Cl. 228—119 **11 Claims**

1. In a process of segregating worn tungsten carbide tools, wherein a significant portion of a relatively large plurality of such tools has been coated with a coating selected from the group of titanium carbide, titanium nitride, chrome, nitrogen entity, carbon entity, and aluminum oxide, the improvements comprising:

preparing a bath of a dilute salt, a metallic portion of the salt being copper;

placing a large proportion of said plurality of worn tungsten carbide tools in said bath;

allowing said plurality of tools to react in said bath for a period of more than five seconds and less than five hours;

draining said tools from said solution;

and segregating, in batch form, the drained tools;

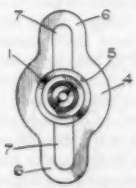
in the act of segregating, segregating by visual indication those tools that have a copper reactant on them as a result of said bath from those that do not.

4,477,010

METHOD OF PRODUCING A METAL TUBE AND FLANGE ASSEMBLY

Jürgen Dufft, Kenilworth, England, assignor to Lucas Industries Limited, Birmingham, England

Filed May 5, 1982, Ser. No. 375,192
Claims priority, application United Kingdom, May 27, 1981, 8116113
Int. Cl.³ B23K *31/00*
U.S. Cl. 228—138 **4 Claims**



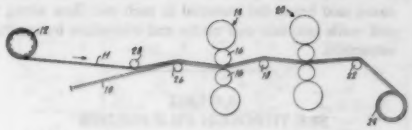
1. A method of producing a pressure cylinder assembly for use in an hydraulic master cylinder comprised of a metal tube and a flat plate-like mounting flange member attached to the tube, comprising the steps of forming in the flange member a peripherally closed through opening which includes a part generally matching the external contour of the tube and being, when the flange member is unstressed, no larger than the minimum external peripheral dimension of the tube at the position where the flange is attached to the tube, said opening also including at least one slot extending outwardly from said matching part and arranged and dimensioned to permit expansion of said matching part by resilient deformation of the member in the region of the slot, expanding said matching part by resilient deformation of the flange member, passing the tube through the expanded matching part until the member lies at the position of attachment, releasing said expanding member to allow the flange member to resiliently recover at least part of said deformation to grip the external surface of the tube, and securing the flange member in position by welding it to the metal tube.

4,477,011

CONTINUOUS CLADDING OF ALUMINUM STRIP

Derek T. Austin, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Sep. 10, 1982, Ser. No. 416,502
Int. Cl.³ B23K *20/04*
U.S. Cl. 228—173 A **12 Claims**



1. A method of continuously cladding aluminum strip, comprising

(a) continuously passing a first aluminum strip, and a second aluminum strip substantially aligned longitudinally with said first strip in contact with a major surface thereof, concurrently through a nip between paired rolls of a warm-rolling mill for jointly warm-rolling the first and second strips to bond them together such that said second strip constitutes a cladding on said first strip major surface, said nip defining a pass line of the mill, while

(b) continuously advancing the first strip to the nip at a first line speed along a first free path over a first single roll spaced ahead of the nip with the top of said first roll disposed above the pass line of the mill such that said first strip advances upwardly to said first roll and then downwardly to said nip, and while

(c) continuously advancing the second strip to the nip at a second line speed different from said first line speed along a second free path

(i) from a locality, ahead of said first roll, at which said second strip is spaced away from said first strip,

(ii) then around and in contact with a second single roll spaced between said locality and said first roll and

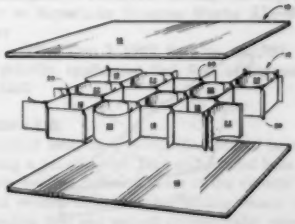
(iii) thereafter, in smooth continuous contact with and substantially aligned with said first strip major surface, over said first roll and into said nip, said second strip moving longitudinally relative to said first strip while in contact with said first strip to cause the disruption of any oxide layers on the contacting surfaces of said first strip and said second strip to assure bonding.

4,477,012

FOIL INSERT HONEYCOMB SANDWICH BRAZING PROCESS AND RESULTING STRUCTURE

Charles L. Holland, Escondido, and Dale L. Jennings, San Diego, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Dec. 13, 1982, Ser. No. 449,149
Int. Cl.³ B23K *31/00*
U.S. Cl. 228—181 **8 Claims**



8. A method of brazing together the interstices between cell nodes of honeycomb core material and the interstices between

the cell edges of the honeycomb core and the surface of adjacent panels comprising:

(a) placing honeycomb core material having selected cells which contain annular sections of resilient braze foil material that are urged into contact with the cell walls, such core material being positioned between top and bottom panels to form a sandwich structure thereby; and

(b) elevating the temperature of said sandwich structure to cause said braze foil material to melt and flow along the cell walls into said cell nodes and interstices by capillary attraction.

4,477,013

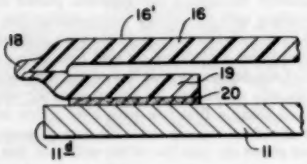
SEE THROUGH FILE FOLDER

Melvin B. Herrin, 1156 Mill Rd. Cir., Rydal, Pa. 19046

Continuation of Ser. No. 241,627, Mar. 9, 1981, abandoned. This application Sep. 7, 1983, Ser. No. 529,925

Int. Cl.³ B65D *37/00*

U.S. Cl. 229—1.5 R **5 Claims**



1. A file folder consisting essentially of: a rear panel of relatively stiff opaque paper having an inner surface and an outer surface; a front panel of transparent plastic material having imperforate inner and outer surfaces, said front panel adapted to overlie said rear panel and be substantially co-extensive therewith, with said inner surface of said front panel adapted to directly abut said inner surface of said rear panel when said folder is in a closed configuration; a panel margin having imperforate inner and outer surfaces formed as an extension of one of said panels through a flexible fold line; and adhesive means for directly and permanently securing one surface of said panel margin to one surface of the other one of said panels so that the inner surfaces of said panels substantially and proximately overlie each other when said folder is closed and so that said rear panel and said front panel are disposed substantially coplanar when said folder is open.

4,477,014

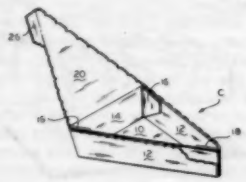
TRIANGULAR CARTON AND OPENING MEANS THEREFOR

Allen M. Brandenburger, Clarkston, Ga., assignor to Container Corporation of America, Chicago, Ill.

Filed May 4, 1983, Ser. No. 491,583

Int. Cl.³ B65D *5/54*

U.S. Cl. 229—22 **1 Claim**



1. A generally triangular carton for holding a single wedge-shaped piece of pastry or the like, said carton being formed from a unitary blank of foldable sheet material, such as paperboard, and comprising:

(a) a body member including a generally triangular bottom wall panel having a rear wall panel and pair of opposed, converging side wall inner panels foldably joined to the rear and side edges thereof and to each other and extending upwardly from said bottom wall panel to form a tray-like structure;

(b) a cover member including:

(i) a generally triangular top wall panel foldably joined at its rear edge to an upper edge of said body member rear wall panel;

(ii) a pair of opposed, converging side wall outer panels foldably joined to side edges of said top wall panel and disposed to extend downwardly therefrom in overlying relation with respective body member side wall inner panels;

(c) each of said side wall outer panels including a single line of weakness separating said side wall panel from said top wall panel and located at the juncture of said outer panel and said top wall panel and extending generally transversely from the rear of said outer panel toward the front thereof;

(d) one of said outer panels including an upper pull tab portion joined to said top wall panel adjacent the front end thereof by a relatively short fold line and being joined to said one outer panel by a weakened line of tear extending downwardly from an upper edge thereof and outwardly to a free front edge thereof;

(e) said outer panel tab portion providing means to grasp said cover member and pull it upwardly in a single motion to separate it from said body member to open the carton and afford access to the contents thereof.

4,477,015

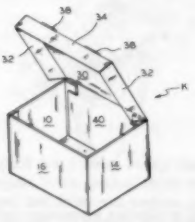
TWO-PIECE, SELF-LOCKING CONTAINER

Gary D. Lozaun, Whittier, Calif., assignor to Container Corporation of America, Chicago, Ill.

Filed May 19, 1983, Ser. No. 496,051

Int. Cl.³ B65D *5/32, 5/36*

U.S. Cl. 229—23 R **1 Claim**



1. A collapsible, two-piece, self-locking container formed of foldable sheet material, such as paperboard, comprising:

(a) a body member including opposed pairs of front and rear side walls and end walls foldably joined to each other and having foldably joined to their lower edges bottom closure flaps disposed in partially overlapping, interlocking engagement with each other to form a bottom wall having a lock bottom construction;

(b) a separate cover member including:

(i) an inner rear wall panel of substantially the same dimensions as and disposed against the inner surface of said body member rear wall and having interlocking engagement therewith to reinforce said rear wall and increase stacking strength of said container;

(ii) an inner bottom wall panel foldably joined to said rear wall panel and of substantially the same dimensions as and disposed against the inner surface of said body member bottom wall to reinforce said bottom wall;

(iii) a top wall panel foldably joined to said rear wall panel and having front and side flanges depending therefrom to provide a hinged cover for said body member;

(c) said cover member rear wall panel presenting a pair of slots located adjacent the upper edge thereof and extending laterally inward therefrom for interlocking engagement with a related pair of slots extending downwardly from the upper edge of said body member rear wall.

4,477,016

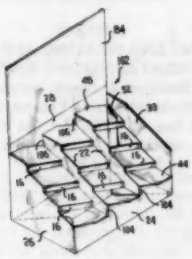
CELLULAR DISPLAY STRUCTURE

Lawrence J. Growney, Pearl River, N.Y., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Mar. 25, 1982, Ser. No. 361,981

Int. Cl.³ B65D *5/48*

U.S. Cl. 229—28 R **17 Claims**



1. A display carton having an integral panel thereof cut and folded to define a one piece cellular separator arrangement comprising an upstanding front panel, an upstanding upper rear panel portion, a set of fore and aft like upstanding partition members directly integrally connected to said front panel and said upper rear panel portion and sloping upwardly from said front panel at the same elevation to said rear panel portion, an upstanding side panel extending forwardly from one end of said rear panel portion to one end of said front panel, and an upstanding side panel portion extending forwardly from the other end of said rear panel portion to a position adjacent the other end of said front panel; and a first plurality of upstanding transverse separators extending between said side panel and an adjacent one of said partition members, a second plurality of upstanding transverse separators extending between adjacent ones of said partition members, and a third plurality of upstanding transverse separators extending between said side panel portion and an adjacent one of said partition members.

15. A blank for forming a cellular separator arrangement, said blank including an elongated generally rectangular panel, plural sets of overlapping sloping cut lines in said panel, all of said cut lines of each set being parallel with adjacent pairs of said cut lines each defining a separator, a transverse fold line at the end of each separator, said plural sets of overlapping cut lines defining at one end of said blank panel a side panel, at the other end of said blank panel a side panel portion, and intermediate partition members, longitudinal cut lines in said panel at first ends of said side panel portion and said partition members defining a front panel, and other longitudinal cut lines in said panel at second ends of said partition members and said side panel defining a rear panel portion.

4,477,017

LOCK BOTTOM CARTON

George P. Webinger, Robbinsdale, Minn., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 461,023, Jan. 26, 1983, abandoned. This application Jan. 30, 1984, Ser. No. 574,947

Int. Cl.³ B65D *5/10*

U.S. Cl. 229—39 R **2 Claims**

1. In a paperboard carton comprising front, back and side wall panels foldably connected in series, a bottom wall construction comprising:

(a) an inner bottom wall panel foldably connected to one of said front and back wall panels along a first fold line and disposed substantially perpendicular to said one of said panels, said inner bottom wall panel including a medial slot having a locking edge disposed parallel to said first fold line with opposite ends of said locking edge being defined by a pair of locking slits;

(b) a pair of intermediate bottom wall panels foldably connected to said side wall panels along second parallel fold lines, said intermediate bottom wall panels including basal portions adjacent to said second fold lines with said basal portions outwardly overlying said inner bottom wall panel, and said intermediate bottom wall panels each further including a locking point extending through said medial slot to inwardly underlie said inner bottom wall panel, each of said intermediate bottom wall panels having a notch between said basal portion and said locking point and said notch defining an edge of each of said intermediate bottom wall panels which edge is parallel to said second fold lines and outwardly adjacent to said locking slits to allow free access to the latter; and

(c) an outer bottom wall panel foldably connected to the other of said front and back wall panels along a third fold line, said outer bottom wall panel overlying said inner bottom wall panel and said intermediate bottom wall panels and including a terminal locking tab extending through said slot to underlie said inner bottom wall panel, said locking tab having opposed lateral locking points which extend past said intermediate bottom wall panel notches and through said locking slits to engage the latter to lock said bottom wall construction in place.

4,477,018

CONTROL UNIT FOR A HEATING AND/OR AIR CONDITIONING SYSTEM FOR AUTOMOBILES

Gerhard Rathgeber, Pliening-Landsham, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Dec. 7, 1982, Ser. No. 447,752

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151255

Int. Cl.³ F24F *7/00, 3/00*

U.S. Cl. 236—1 B **9 Claims**

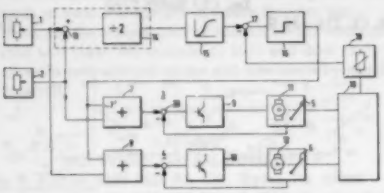
1. A control unit for a system for one of heating and air conditioning a vehicle with first and second heat exchangers respectively heating different areas of the vehicle interior,

first and second desired value setting means respectively generating first and second desired value signals,

first and second control elements respectively controlling said first and second heat exchangers in response to respective first and second desired value signals,

means for sensing at least a single temperature of the vehicle interior,

a controller means responsive to said means for sensing and to said first and second desired value signals for delayed modifying of the thermal output of the first and second



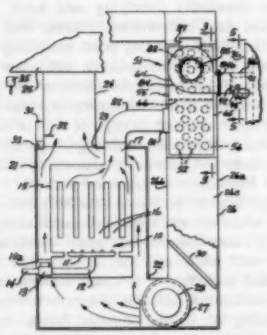
heat exchangers only after receipt of a signal from said means for sensing representing a change in temperature of said interior which is not offset by a corresponding change of at least one of said first and second desired value setting means.

4,477,019

FLUE GAS HEAT RECOVERY APPARATUS FOR A FORCED AIR HOME HEATING SYSTEM

Johnnie J. Breitbach, 2513 Yorktown Dr., Bloomington, Ill. 61071

Filed Sep. 6, 1983, Ser. No. 529,366
Int. Cl.³ F28F 1/10; F24B 7/00
U.S. Cl. 236—10 **6 Claims**



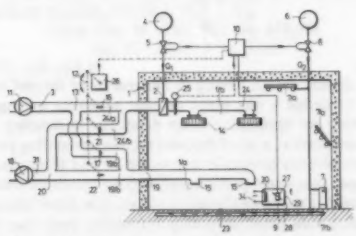
1. In a forced air home heating system of the type which includes a furnace having a combustion chamber and burner means in the combustion chamber, a furnace heat exchanger having a hot gas inlet communicating with the combustion chamber for receiving hot gases therefrom and a furnace flue gas outlet, a return air duct means and a heated air duct means and furnace fan means for blowing air from the return air duct means past the primary heat exchanger to the heated air duct means, burner control means for controlling operation of the burner means, and thermostat means responsive to the temperature of the space to be heated, a heat recovery apparatus comprising a secondary heat exchange unit extending through an opening in one side of the return air duct means to extend crosswise thereof into the path of air flow therethrough, the secondary heat exchange unit including a secondary flue gas inlet chamber located at one side of the return air duct means and having a secondary flue gas inlet therein, the secondary heat exchange unit having a secondary flue gas outlet chamber located at said one side of the return air duct means and adjacent said secondary flue gas inlet chamber and having secondary flue gas outlet therein, a first group of heat exchange tubes communicating at a first end with a secondary flue gas inlet chamber and extending crosswise of the return air duct means, a second group of heat exchange tubes communicating at a first end with the secondary flue gas outlet chamber and extending crosswise of the return air duct means at a level above the first group of heat exchange tubes, means in the secondary heat exchange unit for passing flue gases from the first group of heat exchange tubes to the second group of heat exchange tubes at locations spaced from said first ends thereof, inlet flue pipe means connecting the secondary flue gas inlet to the furnace flue gas outlet of the furnace heat exchanger, induced draft fan means having a fan inlet connected to the secondary flue gas outlet of the secondary heat exchange unit and a fan outlet, outlet flue pipe means connected to the fan outlet, vane means mounted in the outlet flue pipe means for pivotal movement about an axis crosswise of the outlet flue pipe means between a closed position extending transverse to the outlet flue pipe means and an open position, the vane means having means yieldably biasing it to its closed position substantially blocking flow through the outlet flue pipe means and the pivot axis of the vane means being offset from the center of its face area such that it is moved to its open position by the air flow in the outlet pipe from said induced draft fan when the latter is operating, means actuated by the thermostat means for operating said induced draft fan means, and vane switch means responsive to movement of said vane means to its open position for operating said burner control means.

4,477,020

VENTILATING AND HEATING APPARATUS AND HEAT-SENSITIVE UNIT

György Makara, Budapest, Hungary, assignor to Futober Epuletgepeszeti Termekeket Gyarto Vallalat, Budapest, Hungary

Filed Aug. 26, 1981, Ser. No. 296,349
Claims priority, application Hungary, Sep. 16, 1980, 2279/80
Int. Cl.³ F24F 7/00
U.S. Cl. 236—49 **15 Claims**



1. Ventilating and heating apparatus for use in the energy saving perflation of and in keeping temperature at a desired value in spaces of high headroom, the apparatus comprising units for injecting and removing air into/from the room to be ventilated and/or heated, at least one air heating unit suitable for heating the ventilating air, and at least one room heating unit suitable for heating the room, and wherein individual power regulator units and sensor units for heat sensing are assigned to said air heating and room heating units, characterized in that the room (1) accommodated ventilating openings (15) directed to the lower lying sojourn space (1*a*) of the room, used in summer for injection, in winter for drawing-off, as well as ventilating openings (14) directed to the space outside the lower lying sojourn space (1*a*), expediently to the space (1*b*) under the ceiling, used in winter for injection, in summer for drawing-off; the power regulator unit (5) of each said air heating units (2) and the power regulator unit (8) of each said room heating unit (7) are connected with an automatic regulator (10) forcing first the air heating unit (2), afterwards the room heating unit (7) to decrease their power if the value of heat sensation indicated by the sensor unit of heat sensation (9) exceeds during a predetermined time period an adjusted equilibrium

base value (t_o); and inversely, forcing first the room heating unit (7), afterwards the air heating unit (2) to increase their power if a lower value of heat sensation is indicated during a predetermined time period.

4,477,021

METHOD AND APPARATUS FOR A REGULATED HEAT TRANSFER FROM A PRIMARY STEAM NETWORK TO A HEAT CONSUMER

Helmut Bälz, Kopfstrasse 5, D-7100 Heilbronn, Fed. Rep. of Germany

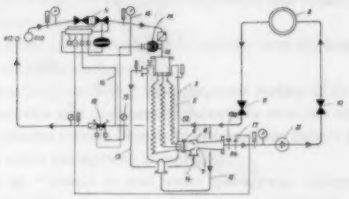
PCT No. PCT/DE81/00093, § 371 Date Jan. 28, 1982, § 102(e) Date Jan. 28, 1982, PCT Pub. No. WO81/03680, PCT Pub. Date Dec. 24, 1981

PCT Filed Jun. 19, 1981, Ser. No. 346,036

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022795

Int. Cl.³ F25C *1/18*

U.S. Cl. 237—67 **11 Claims**



1. Apparatus for regulated transfer of heat from a primary steam network (010-01-012) to a heat consumer (2) having

a secondary heat network or circuit (04, 02);

a heat exchanger (3) connected to the primary steam network and to the secondary network for heat exchange between steam in the primary network and a heat exchange medium in the secondary network;

a regulator valve (4) connected in the primary steam network to control heat consumption requirements by the consumer,

the steam in the primary network being cooled to the point of condensation and being supplied at a predetermined excess pressure with respect to the pressure in the secondary network,

and comprising, in accordance with the invention,

an injector pump (8) having an injector nozzle (7) connected downstream of the heat exchanger and receiving the condensate therefrom at said predetermined excess pressure;

the injector pump having its injection intake connected in the secondary circuit (04, 02) to heat the secondary medium by flow through the heat exchanger and mixing the secondary medium in the injector pump with the condensate in the primary network, while providing energy to the secondary medium in the secondary circuit for circulation of the secondary medium within the secondary circuit and through the heat consumer (2) in accordance with a regulated, predetermined proportion as determined by said regulator valve (4).

4,477,022

POLARIZING AND LATCH ARRANGEMENT FOR AN ELECTRICAL CONNECTOR

John R. Shuey, Carlisle, and Donald R. Widener, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 23, 1982, Ser. No. 351,560

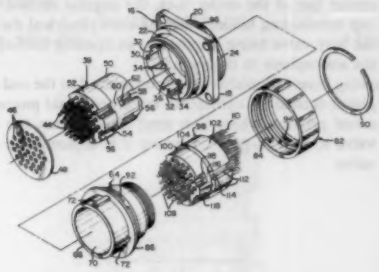
Int. Cl.³ H01R *11/00, 13/62*

U.S. Cl. 339—59 M **4 Claims**

1. An insert-in-housing assembly for an electrical connector comprising a housing member, and a contact-carrying insert member latchably securable therein containing one or more electrical contact members, characterized in that:

said contact-carrying insert member has an outer section having integral flexible latching means therearound, and said insert member has grooves underlying said integral flexible latching means,

said housing member has an inner section having keying projections on each of which is located a latching projection;



said keying projections correspond with said grooves and are matably engageable therewith to position said insert member in said housing member;

said integral flexible latching means is capable of being flexed by said latching projections into said grooves as said latching projections move thereover during assembly of said insert member into said housing member and thereafter returning to an unflexed condition latchably engaging said latching projections when said insert member is in a fully mated condition in said housing;

4,477,023

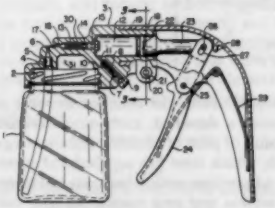
HOT SPRAY APPARATUS

James T. Gates, 1611 Kirkley Rd., Columbus, Ohio 43221

Continuation-in-part of Ser. No. 261,249, May 6, 1981, abandoned. This application Feb. 10, 1983, Ser. No. 465,515

Int. Cl.³ B05B *7/30*

U.S. Cl. 239—340 **10 Claims**



1. Apparatus for spraying liquid butter or the like onto food comprising,

a container with an upper opening for holding the liquid butter,

a cap attached in liquid tight engagement to the upper opening of the container, a hole through the cap communicating with the atmosphere and the inside of the container to allow the entrance of air upon the extraction of liquid from the container through the cap,

a suction tube extending from the cap to near the bottom of the container, the upper end of the tube being connected in fluid tight engagement with the cap within a cylindrical opening, a cylindrical duct of about 1/32 inch diameter leading from the cylindrical opening through the cap to the atmosphere,

the cap including a cylinder containing a reciprocable piston which closes one end of the cylinder, the other end of the cylinder terminating in a check valve, the check valve communicating with an outlet duct of about 0.025 inches diameter and extending perpendicular to the cylindrical duct, the terminus of the outlet being about 0.080–0.100 inches from the center line of the cylindrical duct and the surface of the cap extending at an angle from immediately below the terminus of the outlet duct upwardly to the center line of the outlet duct, the angular surface of the cap terminating before reaching the cylindrical duct,

a one way valve being disposed in an opening leading from the atmosphere to the cylinder,

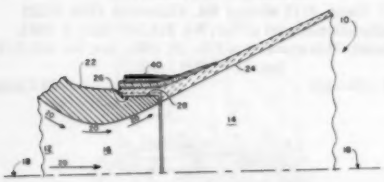
a spring biased pivotable trigger connected to the end of the piston outside the cylinder to reciprocate said piston from a rest position where it is most remote from the check valve to an end position where it is adjacent the check valve.

4,477,024

CARBON/CARBON ROCKET MOTOR EXIT CONE REINFORCEMENT

Peter F. O'Driscoll, Los Altos; Gerald E. Crowe, Santa Clara, and John Berry, Morgan Hill, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 5, 1983, Ser. No. 482,375
Int. Cl.³ B63H *11/14*
U.S. Cl. 239—265.11 **3 Claims**



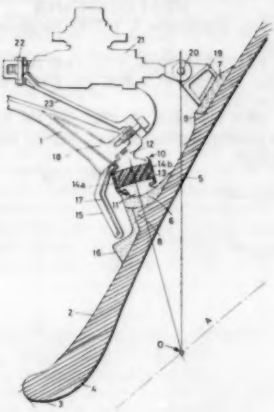
1. In a carbon-carbon exit cone for a rocket motor, which cone comprises a densified, carbonized laminate fabricated from a plurality of plies of phenolic resin-impregnated woven carbon cloth; which cone has a cylindrical section, a conical section and a transition section between and integral with said cylindrical section and said conical section, said cylindrical section having inside threads for connecting said cone to the throat piece of said rocket motor, said conical section diverging outwardly from said transition section; said cone comprising a first layer of cured material surrounding said cylindrical section, said transition section and a portion of said conical section, said first layer being fabricated from a plurality of spiral windings of phenolic resin-impregnated carbon fiber cloth tape, said cone yet further comprising a second layer of cured material surrounding said first layer above said cylindrical section and said transition section, said second layer being fabricated from a plurality of spiral windings of phenolic resin-impregnated high silica cloth tape; the improvement which comprises a third layer of cured material surrounding said second layer above said cylindrical section, said third layer being fabricated from helically wound epoxy resin-impregnated carbon fiber.

4,477,025

HOT NOZZLE

Max Calabro, Suresnes; Hervé Girard, Les Mureaux, and Alain Le Corre, Courbevoie, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Nov. 2, 1978, Ser. No. 957,309
Int. Cl.³ B63H *11/00*
U.S. Cl. 239—265.35 **2 Claims**



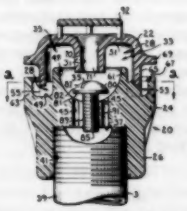
1. A solid propellant jet propulsion unit having a nozzle, said nozzle comprising a substrate of carbon yarn woven three-dimensionally into a shaped body of revolution and densified to form a monobloc structure defining at least a convergent section, a throat, and a divergent section, said body of revolution being provided with a pair of spaced circumferential integerally formed ribs projecting outwardly from the exterior surface thereof, a first thermal insulation ring rigidly connected to and supported by one of said ribs and a second thermal insulation ring rigidly connected to and supported by the other of said ribs.

4,477,026

BUBBLER HEAD STRUCTURE

James F. Lockwood, Lenexa, Kans., assignor to Imperial Underground Sprinkler Co., Lenexa, Kans.

Filed Sep. 30, 1982, Ser. No. 430,825
Int. Cl.³ E03C *1/08*
U.S. Cl. 239—428.5 **8 Claims**



1. A bubbler head for use in impregnating irrigation water with air and gently sprinkling the impregnated water over the ground in a nonerosive fashion; said irrigation water being pressurized and supplied to the bubbler head through a standpipe; the bubbler head comprising:

(a) a body having a longitudinal axis therethrough; said body comprising:

(1) a cylindrical lower portion having an inner and an outer surface;

(2) a cylindrical upper portion having an inner and an outer surface;

(3) a plurality of spacers attaching said upper portion to said lower portion;

(4) supply connection means positioned on an inner surface of said lower portion and threadably engaging the standpipe; said connection means comprising an internally threaded coupling;

(5) a plurality of cylindrical overlapping baffle walls comprising:

(i) concentric inner and outer baffle walls extending upwardly from said lower portion inner surface; and

(ii) an intermediate baffle wall concentrically extending between said inner and outer walls and attached to said upper portion inner surface;

(6) a cylindrical nipple extending from said upper portion inner surface;

(7) a circular lip extending outwardly from the intermediate baffle wall; and

(8) a shield extending from the outer surface of the upper portion and positioned substantially over the nipple to prevent foreign objects from becoming lodged therein;

(b) a water passageway comprising:

(1) an entrance to said water passageway comprising a plurality of centrally located and uniformly spaced orifices through said lower portion allowing high velocity water flow axially therethrough; said orifices being parallel to said longitudinal axis and positioned inwardly of said inner baffle wall; and

(2) a mixing chamber including a serpentine water passageway between said baffle walls;

(c) a cylindrical air passageway comprising a bore through said upper portion and through said nipple, said air passageway communicating with said mixing chamber whereby travel of water through said mixing chamber impregnates said water with air;

(d) a cylindrical aperture concentric with said longitudinal axis extending through said lower portion;

(e) aspiration means for drawing air through the air passageway comprising a selectively adjustable throttling screw threadably engaging said aperture and having a head thereon with a first surface for deflecting high velocity water exiting said orifices; said head adapted for being contained within said inner baffle wall and of sufficient diameter for said first surface to extend completely over said orifices to deflect water exiting said orifices; said throttling screw head having a second surface positioned in facing relation to the air passageway whereby air adjacent said second surface is drawn along with the high velocity deflected water; and

(f) an exit passageway between said lip and said outer baffle wall for discharging the water and air combination in a nonerosive fashion;

(g) whereby the pressurized water flows through the connection means, increases velocity through said orifices, deflects around said throttling screw, draws air through said nipple and into entrainment, flows over said inner wall, flows under said intermediate wall, flows out said exit passageway and sprinkles over the ground in an umbrella like fashion.

4,477,027

ELECTROMAGNETICALLY ACTUATABLE VALVE, IN PARTICULAR A FUEL INJECTION VALVE FOR FUEL INJECTION SYSTEMS

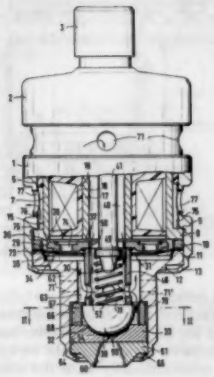
Heinrich Knapp, Leonberg; Rudolf Sauer, Benningen; Rudolf Krauss, Stuttgart, and Udo Hafner, Lorch, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 14, 1982, Ser. No. 378,453

Claims priority, application Fed. Rep. of Germany, May 21, 1981, 3120160

Int. Cl.³ F02M *51/00*

U.S. Cl. 239—585 **5 Claims**



1. An electromagnetically actuatable valve, particularly a fuel injection valve for fuel injection systems of internal combustion engines, having a valve housing, a core having an end face, a magnetic winding and an armature, said armature being firmly connected with a valve element cooperating with a fixed valve seat and guided parallel to said end face of said core by a guide diaphragm clamped to said housing on its outer circumference, and further wherein said guide diaphragm rests under spring tension on a concentric guide edge of said armature on the side of said armature oriented toward said valve seat, said valve element having a tubular section secured at one end to said armature, said tubular section extending through said diaphragm free of any contact therewith and including a spherical end section secured thereto which cooperates with said valve seat, a guide ring juxtaposed said valve seat including a guide opening into which said valve element protrudes, and said guide opening guides said valve element coaxial relative to said valve seat.

4,477,028

COMMINUTER WITH COACTING DISCHARGE SCREENING DEVICE

John H. Hughes, 405 N. 18th, Elma, Wash. 98541

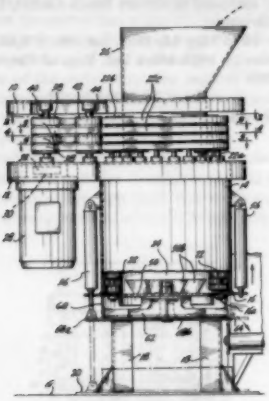
Filed May 27, 1982, Ser. No. 382,483

Int. Cl.³ B02C *4/02, 13/14*

U.S. Cl. 241—69 **9 Claims**

1. Apparatus for comminuting solids such as rocks and chunks of wood comprising first means housing and stationarily mounting for rotation an annular series of successively adjacent, elongated, generally cylindrical upright comminuting rolls having article abrading projections on the surfaces thereof, the series of said rolls defining an open upright generally tubular comminuting chamber encompassed by the rolls, drive power means applying drive torque for codirectionally rotating each of said rolls, said first means providing an opening leading into an upper region of said chamber for introduction of solids to be comminuted by action of the driven rolls, causing the solids to tumble against the rolls and each other

and to undergo orbital swirling motion as a mass within said chamber, second means forming a bottom for the chamber to support such solids in said chamber and including an annular housing base member defining a central generally horizontal orifice in register with said chamber, and a rotative screening member mounted to turn on an upright axis in superposed



register with said orifice and having a peripheral edge spaced from the edge of said orifice so as to define therebetween a size restriction passage for descending particles comminuted from such solids by abrasive action on said rolls, said screening member rotating codirectionally with the swirling motion of the overlying solids in said chamber.

4,477,029

SHREDDING MACHINE

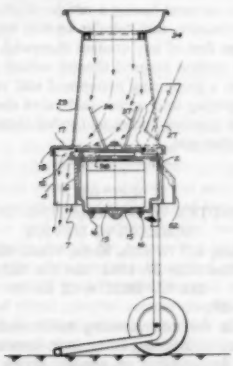
Douglas F. Green, Brisbane, Australia, assignor to Rover-Scott Bonnar Limited, Brisbane, Australia

Filed May 13, 1982, Ser. No. 377,845

Claims priority, application Australia, May 15, 1981, PE8895

Int. Cl.³ B02C *18/18*

U.S. Cl. 241—101.7 **3 Claims**



1. A shredding machine comprising a housing with a lower shredding chamber located in an upper part of said housing, the lower chamber being provided with a discharge port communicating with a discharge duct from the housing; an upwardly extending trunk mounted on the housing and having a free end and a lower portion spaced below said free end, the lower portion of said trunk forming an upper shredding chamber communicating with the lower shredding chamber, a feed hopper located on the free end of said trunk and having a restricted inlet to the trunk spaced from the upper shredding chamber; power means supported in the housing with an output shaft thereof extending into the lower shredding chamber and having a bore in the end thereof; upper and lower cutting means fixed to the output shaft, the upper cutting means being adapted for rotation in the upper shredding chamber and the lower cutting means being adapted for rotation in the lower shredding chamber, a disc having a centrally disposed bore there-through, means fixing said disc to the output shaft of the motor with said output shaft passing through said bore in said disc, said disc having spaced diametrically opposed slots therein, said lower cutting means comprising a body portion with four arms extending therefrom and constituting cutting blades, the body portion having a centrally disposed bore there-through with diametrically opposed slots positioned on opposite sides of said bore, said bore and said slots in said body portion being adapted to register with said bore and said slots, respectively, in said disc, the upper cutting means comprising a substantially U-shaped member having a bight portion with limbs of said U-shaped member upstanding therefrom and diverging from each other, a bore in the bight portion adapted to register with the bore in said body portion; a saddle clamp having a central portion positioned across the bight portion and tongues, which extend transverse to said central portion and pass through the slots in the body portion and engage in the slots in the disc, said central portion having a bore therethrough adapted to register with said bore in said bight portion, and a bolt engaged in said bore in the end of the output shaft so that there can be no relative rotation between the upper and lower cutting means and the disc secured to said output shaft; a feed duct in said trunk and extending through said upper shredding chamber and terminating above the lower shredding chamber, that portion of the feed duct in the shredding chamber constituting a shear plate which cooperates with the upper cutting means to reduce material fed to said upper shredding chamber, said lower shredding material fed through said feed duct.

4,477,030

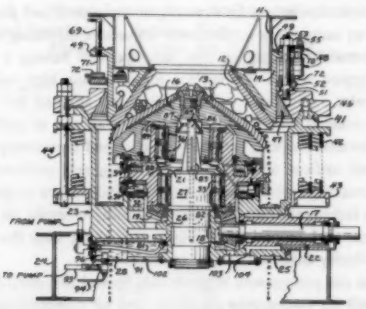
CONE CRUSHERS

Paul R. Vifian, and Gregory C. Kint, both of Cedar Rapids, Iowa, assignors to Pettibone Corporation, Chicago, Ill.

Filed Sep. 18, 1980, Ser. No. 188,371

Int. Cl.³ B02C *2/04*

U.S. Cl. 241—208 **17 Claims**



1. In a gyratory crusher having as crushing tools an annular concave through which material to be crushed is fed and a cone facing it and supported by a base, and having means for causing relative gyratory movement between the tools; the concave being carried by a bowl which is supported by a support ring carrying the bowl with vertical adjustability for varying product size, the improvement in which:

the bowl is rigidly locked to the support ring by both a stack of shims maintained under pressure by spring means, with

the support ring limiting the relative spring-biased movement of the bowl, and wedge-clamping means maintained in wedging condition by spring means acting separately thereon, the spring means maintaining both of their spring biasings during operation of the crusher independently of hydraulics, and

hydraulic expansion means is provided for overcoming both spring biasings to release both the shims and the wedge-clamping means.

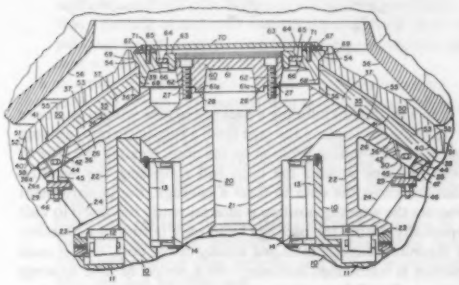
4,477,031
APPARATUS FOR READY CONVERSION OF CRUSHING CAVITY CONFIGURATION IN A CONE CRUSHER

Peter B. Alford, Cheshire, Oreg., assignor to Iowa Manufacturing Company, Cedar Rapids, Iowa

Continuation of Ser. No. 152,788, May 23, 1980, abandoned. This application Apr. 19, 1982, Ser. No. 369,931

Int. Cl.³ B02C *2/04*

U.S. Cl. 241—211 **11 Claims**



1. In a crusher of the cone type including a gyratory head having an exterior generally frusto-conical surface coaxial therewith and uprightly disposed with upper and lower ends, the distance along said surface between said ends thereof defining the slant height of said surface, the head terminating in a truncated end portion adjacent the upper end of said head surface, the improvement comprising: a generally frusto-conical annular mantle adapter for the head having upper and lower ends, the adapter being disposable upon the head in coaxial sandwiched relation between said head surface and a generally frusto-conical annular mantle having upper and lower ends corresponding respectively to said ends of the adapter, the adapter including an interior generally frusto-conical surface coaxial therewith having upper and lower ends, the distance along said interior adapter surface between said ends thereof defining the slant height of said interior adapter surface, said ends thereof being effective to support the adapter upon said head surface by face-to-face contact between said head and adapter surfaces at a plurality of spaced locations including the upper and lower ends of both surfaces when the adapter is disposed upon the head as aforesaid, the adapter also including an exterior generally frusto-conical surface having upper and lower ends, the distance along said exterior adapter surface between said ends thereof defining the slant height of said exterior adapter surface, said exterior adapter surface being coaxial with the adapter adjacent said lower end thereof effective to support the lower end of the mantle by face-to-face contact between said exterior adapter surface and an interior frusto-conical surface disposed adjacent the lower end of the mantle; lower releasable means operative between the lower ends of the adapter and the head to force said head surface and interior adapter surface into tight engagement with each other; and upper releasable means operative against the upper end of the mantle to force said exterior adapter surface and interior mantle surface into tight engagement with each other.

4,477,032
METHOD AN APPARATUS FOR INSERTING THREADS AND SIMILAR ITEMS INTO A WINDING DEVICE

Peter M. Pfyffer, Winterthur, and Albert Ruegg, Pfäffikon, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

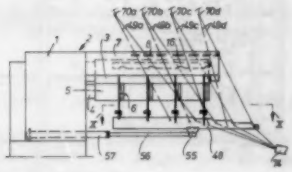
PCT No. PCT/EP81/00169, § 371 Date Jun. 15, 1982, § 102(e) Date Jun. 15, 1982, PCT Pub. No. WO82/01539, PCT Pub. Date May 13, 1982

PCT Filed Oct. 23, 1981, Ser. No. 395,037

Claims priority, application Switzerland, Oct. 31, 1980, 8118/80

Int. Cl.³ B65H *54/02, 54/20*

U.S. Cl. 242—18 PW **10 Claims**



1. A method of inserting threads or the like into a winding device including at least two traversing devices in axial juxtaposition defining a sweep zone, bobbin tubes associated thereto and each provided with catching means for a related one of said threads, a bobbin chuck having an exterior end and carrying said bobbin tubes, a thread suction device, and first thread guides each associated with a related one of said threads and being arranged above said winding device, said method, comprising the steps of:

taking up each said thread by means of said suction device as the threads come from said first thread guides;

placing each said thread by means of said suction device onto a thread guide device arranged above said sweep zone;

guiding said threads by means of said suction device outside said sweep zone defined by said at least two traversing devices;

placing pivotable second thread guides, which are arranged below said sweep zone defined by said at least two traversing devices and each of which second thread guides is associated with a related one of said threads, in an initial position at said exterior end of said bobbin chuck;

displacing said second thread guides from said initial position into a position in front of said catching means while simultaneously taking up each said thread by a related one of said second thread guides;

holding said threads in an intermediate position precisely in front of said catching means;

taking-up all said threads in said catching means; and

winding-up said threads on said bobbin tubes.

4,477,033
ON-LINE WINDING MACHINE

Frank W. Kotzur; Gregory A. Kotzur, both of Mahopac; John F. Meade, Yonkers, and Donald J. Hopko, Carmel, all of N.Y., assignors to Windings, Inc., Goldens Bridge, N.Y.

Continuation of Ser. No. 312,286, Oct. 15, 1981, abandoned. This application Jul. 6, 1983, Ser. No. 510,995

Int. Cl.³ B65H *54/02, 54/10*

U.S. Cl. 242—18 A **28 Claims**

1. Winding machine for the winding of flexible material, comprising:

first and second independently operable spindles mounted

for rotation about respective spaced parallel axes in a machine frame;

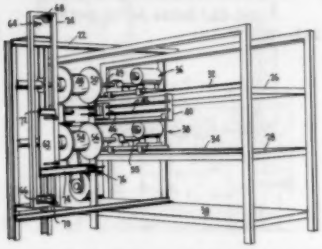
first and second mandrels removably mounted respectively on each of said first and second spindles;

a traverse guide mounted to said machine frame for reciprocating movement along an axis parallel to, and spaced from, said spaced parallel axes;

means for independently rotating each of said first and second spindles;

means for reciprocating said traverse guide in cooperation with said means for independently rotating to consecutively wind flexible material on said first and second mandrels;

first transfer means mounted for movement in a first plane substantially parallel to said spaced parallel axes for engagement of the flexible material from said traverse guide to one of said first or second mandrels;



second transfer means mounted for movement in a second plane transverse to said first plane and extending between said spaced parallel axes for engagement of the flexible material extending from said traverse guide to one of said first or second mandrels in cooperation with said first transfer means;

and

means for controlling said means for rotating and said means for reciprocating for winding flexible material onto said first or second mandrels and for controlling said first and second transfer means to transfer flexible material from a completely wound first or second mandrel to the other mandrel for winding of flexible material thereon.

4,477,034

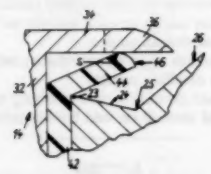
THREAD CATCHING STRUCTURE

Heinz Oswald, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Aug. 15, 1983, Ser. No. 523,191

Int. Cl.³ B65H *75/28, 75/32*

U.S. Cl. 242—18 PW **20 Claims**



1. A thread catching ring structure for use on a chuck of a filament winding machine, said ring structure comprising at least one axially directed projection having an underside facing radially inwardly and a thread guiding edge, a guide surface for guiding a thread radially inwardly under the projection and a clamping element for clamping the thread against the underside of the projection, said element comprising a first portion securing the element to the structure and a second portion connected to the first and extending away therefrom, the second portion being pivotable relative to the first portion under the influence of centrifugal force acting thereon in use to cause a surface portion to press against the underside of the projection.

4,477,035

WINDING A PACKAGE OF TAPE

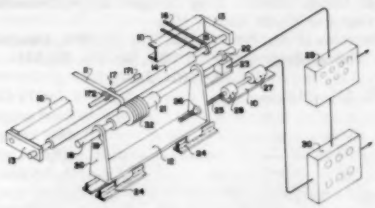
Lawrence O'Connor, 386 Overdale St., Winnipeg, Canada

Filed Jan. 31, 1983, Ser. No. 462,558

Claims priority, application United Kingdom, Feb. 4, 1982, 8203185

Int. Cl.³ B65H *17/02, 54/28*

U.S. Cl. 242—67.1 R **15 Claims**



1. In a method of building a package of tape wound on a core comprising forwarding the tape from a supply thereof, guiding the tape to a winding position on the core, rotating the core to wrap the tape around the core and traversing the winding position across the core to form a package, the improvement wherein the winding position is intermittently traversed to visit repeatedly during the package build each in turn of a plurality of separate positions arranged axially of the core, and at each position is maintained stationary for a period of time to wrap tape spirally of the core.

4,477,036

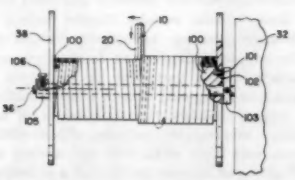
METHOD OF WINDING STRIP MATERIAL AND LINING STRIP

John R. Rundo, Strongsville, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,293

Int. Cl.³ B65H *17/02, 81/00*

U.S. Cl. 242—67.2 **5 Claims**



1. A method of winding a tacky sealant strip that has an upper surface, a lower surface and a pair of side surfaces comprising the steps of feeding said sealant strip; feeding an indeterminate length liner into abutting contact with said lower surface of said strip of tacky sealant to form a tape wherein said liner is of greater width than said strip to extend marginal edge portions of said liner strip on either side of said longitudinally extending strip; feeding said strip and said liner as a tape into contact with the hub of a flanged rotatable reel with said upper tacky surface of said strip fed into abutting contact with said hub; and winding said tape progressively onto said hub to form a single row with said marginal edges of said liner contacting one of said side surfaces of an adjacent sealant strip for spacing

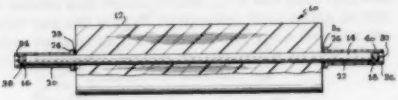
said windings of said sealant strip to provide spacing between adjacent side surfaces of said sealant strip.

4,477,037

STRETCH-WRAP FILM DISPENSER

Joseph Goldstein, 1325 Southwind Cir., Westlake Village, Calif. 91361

Filed Mar. 29, 1983, Ser. No. 480,099
Int. Cl.³ B65H *17/44, 23/06;* B44C *7/00*
U.S. Cl. 242—75.4 **5 Claims**



1. A single use, throwaway stretch-wrap film dispenser comprising:

an elongated substantially rigid tubular polymer material core defining an axis, a roll of stretch-wrap film wound on said core, said roll of stretch-wrap film being positioned so that a portion of said core extends outwardly on each end past said roll of stretch-wrap film, said core rotating with said roll of stretch-wrap film;

a polymer material tubular handle rotatably mounted on each end of said core outboard of said roll of stretch-wrap film and receiving said core within said handle for manual grasp around the axis, an outwardly directed radial flange integrally formed on each said handle, said flanges being on the ends of said handles toward said roll of stretch-wrap film;

a brake disc engaged by said flange on each said handle so that increased axial pressure on said brake discs causes increased rotative drag between said roll of stretch-wrap film and said handles; and

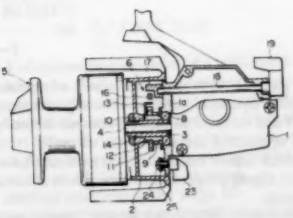
a screw-threaded tension member extending completely through said core and interengaging said handles outward of said core to control axial force on said brake means, said interengagement comprising a threaded nut positioned in each of said handles outward of said core and engaging on said screwthread so that said nuts screw down upon said screwthread as one of said handles is rotated with respect to the other of said handles to compress said brake discs.

4,477,038

CLICK DEVICE WITH A LINE SAGGING PREVENTION MECHANISM FOR A FISHING REEL

Toshiaki Yorikane, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Sep. 29, 1982, Ser. No. 427,034
Claims priority, application Japan, Nov. 3, 1981, 56/164605[U]
Int. Cl.³ A01K *89/01, 89/02*
U.S. Cl. 242—84.21 R **4 Claims**



1. A spinning reel comprising:

(a) a reel body having a plate and a tubular shaft rotatably mounted thereon;

(b) a rotor rotatably supported on said tubular shaft and rotatable in opposite directions;

(c) an anti-reverse mechanism mounted on said plate for selectively preventing said rotor from rotating in one of said opposite directions; and

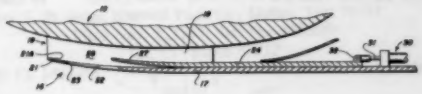
(d) a click device comprising a click gear rotatably mounted on said tubular shaft for rotation with said rotor, a click pawl pivotably mounted on said plate for engagement with said click gear to produce clicks, a switch lever pivotably mounted on said plate, a brake lever pivotably mounted on said plate and engageable with said click pawl, a first spring connected between said click pawl and said switch lever for enabling said click pawl to engage with and disengage from said click gear in response to actuation of said switch lever, and a second spring connected between said plate and said brake lever for causing said brake lever to engage said click pawl when said rotor rotates in said one of opposite directions while said click pawl engages said click gear, whereby said rotor can be resisted in its rotation in said one of opposite directions.

4,477,039

VENTED COWL VARIABLE GEOMETRY INLET FOR AIRCRAFT

Donald G. Boulton, Henry County, Tenn., and Gerald T. Arcangeli, St. Louis County, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Jun. 30, 1982, Ser. No. 393,648
Int. Cl.³ B64D *33/02*
U.S. Cl. 244—53 B **7 Claims**



1. In a vented cowl variable geometry air inlet structure for the body of an aircraft, the improvement comprising:

(a) cowl means on the aircraft body in position to extend longitudinally along side the body and arranged therewith for defining an air flow passage having an air inlet presented to the airstream, said passage being formed with air escape vent means spaced from said inlet in the direction of airflow in said cowl means for venting air to the exterior of the passage;

(b) door means carried by said cowl means for selective movement between a first position moved for closing said air escape vent means and a second position moved for opening said air escape vent means; and

(c) said door means and said cowl means defining a contracted throat located downstream beyond the leading edge of said vent means, and said door means in said second position effecting a change in the geometry of the airflow passage whereby said inlet can be started for supersonic operation of the vented cowl inlet.

4,477,040

AIRCRAFT WIND ENERGY DEVICE

James J. Karanik, Farmingville, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

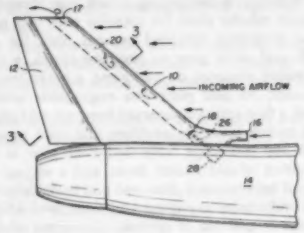
Continuation of Ser. No. 952,798, Oct. 19, 1978, abandoned. This application Aug. 25, 1980, Ser. No. 180,763
Int. Cl.³ B64D *31/00*
U.S. Cl. 244—58 **5 Claims**

1. Aircraft apparatus for generating rotating shaft power from atmospheric air comprising:

an open ended tower fixed to a leading edge of an aircraft, said tower including first air inlet means for admitting air

into said tower along a substantial length thereof, and means for continually channelling the flow of air entering said first air inlet means as to create a vortex flow regime having a low pressure core within said tower;

second air inlet means for admitting air into one end of said tower; and



turbo machine means interposed within said tower between said second air inlet means and said low pressure core, said machine means being adapted to be driven by positive fluid pressure entering said second air inlet means as augmented by relatively negative fluid pressure in the proximity of said low pressure core.

4,477,041

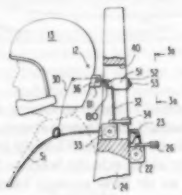
HEAD AND NECK RESTRAINT SYSTEM

Michael Dunne, 9012 Beatty Dr., Alexandria, Va. 22308

Filed Aug. 19, 1982, Ser. No. 409,684

Int. Cl.³ B64D *25/04*

U.S. Cl. 244—122 AG **10 Claims**



1. A method of protecting the posterior neck and cervical spinal cord from injury when the torso of the user is restrained with respect to selected points on a fixed structure, when subjected to sudden deceleration or acceleration forces, by engaging the chin/forehead of the person's head with portions of a crash helmet, and transmitting the reaction forces bearing on said forehead and chin via said crash helmet and a flexible connection having a predetermined degree of stretch, coaxially along a single line passing only through the superior nuchal line on the back of the skull and substantially perpendicular to the axial line of the vertebrae-skull in the normal erect posture of the user, whereby rapid angulation movements of the head and neck do not occur during sudden forward-deceleration or upward-acceleration with ejection seat usage.

4,477,042

VORTEX ALLEVIATING WING TIP

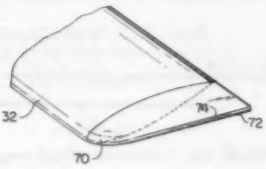
Roger W. Griswold, II, Ben Franklin Rd., Old Lyme, Conn. 06371

Continuation-in-part of Ser. No. 226,191, Jan. 19, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,736

Int. Cl.³ B64C *23/00*

U.S. Cl. 244—199 **24 Claims**

24. An aircraft comprising a main body and an airfoil having upper and lower surfaces for producing lift when the airfoil is moved through air, the airfoil being connected at one end with the body of the craft and having an opposite, outer end from which fluid dynamic vortices emanate due to the mergence of fluid flows from above and below the foil while the foil is producing lift, the outer end of the foil projecting spanwise and having upper and lower surfaces meeting substantially at 180 degrees without concave portions at any spanwise section in the part of the tip forward of the chord point of maximum thickness, and aft of the chord point of maximum thickness



gradually tapering to a sharply angled edge for vortex precipitation which edge in planform is located effectively no closer to the main body at the trailing edge of the foil than at the midchord region to prevent inward migration of the vortex origins and to reduce the induced drag, the gradual tapering providing substantially no curvature of the surfaces in the chordwise direction aft of the chordpoint of maximum thickness to correspondingly reduce the differential pressure between the upper and lower surfaces and reduce the strength of the vortices produced thereby.

4,477,043

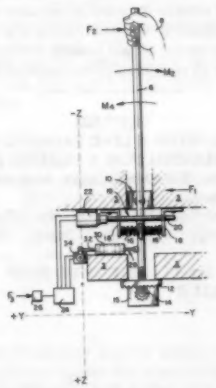
BIODYNAMIC RESISTANT CONTROL STICK

Daniel W. Repperger, Vandalia, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 15, 1982, Ser. No. 449,922

Int. Cl.³ B64C *13/04, 13/46*

U.S. Cl. 244—223 **5 Claims**



1. An aircraft control system which comprises:

(a) a pilot operable member pivotally connected to the aircraft and adapted so that movement thereof causes deflection of control surfaces of the aircraft;

(b) a force sensor connected to the aircraft for generating a force signal proportional to a given force acting on the aircraft;

(c) a processor embodying an algorithm capable of translating said force signal representing said given force acting on said aircraft into a processed signal representing a

resistant force correlated with a particular biodynamic force generated by the aircraft pilot's arm on said pilot operable member due to said given force on said aircraft, said processor, upon receiving said force signal from said force sensor, being capable of performing said translation and generating said processed signal;

(d) resilient means connected to the aircraft and to said pilot operable member; and

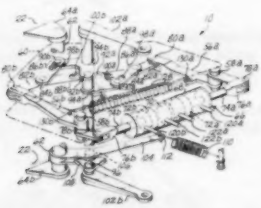
(e) an actuator connected to the aircraft and to said pilot operable member by said resilient means, said actuator being capable of receiving said processed signal and, in response to said signal, of adjusting said resilient means so as to impose said resistant force upon said pilot operable member and null out said biodynamic force acting on said member induced by the action of said given force on the aircraft, as exerted through the arm of the aircraft pilot.

4,477,044

ELEVATOR FEEL ACTUATOR

Kevin A. Darcy, Seattle, Wash., and Terence F. H. Faithfull, Surrey, England, assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 17, 1983, Ser. No. 458,516
Int. Cl.³ B64C *13/46*
U.S. Cl. 244—223 **2 Claims**



1. An airplane elevator movement feel mechanism comprising: a hydraulic feel unit responsive to elevator control movement, means for varying the reaction of the hydraulic feel unit to reflect varying aircraft operating conditions, a bias spring located to directly work against the hydraulic feel unit for partially counteracting the hydraulic feel unit to all but cancel out the hydraulic feel unit at the lowest hydraulic feel unit setting, and a spring means for supplementing the hydraulic feel units for providing the feel means in case of an emergency in the hydraulic feel units.

4,477,045

METHOD OF CONTROLLING A SELF-LEVELLING DEVICE

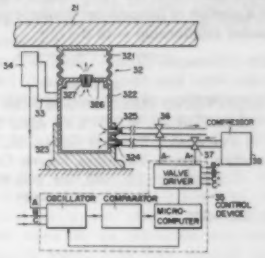
Kohichi Karasawa; Takeo Itoh; Humihito Koizumi, all of Sagamihara, and Kimio Uchida, Yokohama, all of Japan, assignors to Showa Electric Wire & Cable Co., Ltd., Kawasaki, Japan

Filed Oct. 20, 1981, Ser. No. 313,210
Claims priority, application Japan, Oct. 23, 1980, 55-148829; Oct. 9, 1981, 56-161177
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—1 **5 Claims**

1. A method of controlling the level of a self-levelling device including a table to be controlled to a predetermined level, an air spring supporting the table, a sensor for contactless detection of an amount of displacement of the table from a reference position, an inlet valve for supplying air under pressure to the air spring through an inlet port therein, and an outlet valve for discharging air from the air spring through an outlet port therein, said method comprising the steps of:

measuring an upward movement amount and a downward movement amount of the table which correspond to a predetermined period of time during which said inlet and outlet valves are actuated respectively while the self-levelling device is in operation;

storing in a controller, data on a width of electric pulse to energize the respective valve for moving said table upwardly or downwardly by unit distances on the basis of a relationship between each of said upward and downward movement amount of said table and said predetermined period of time; and



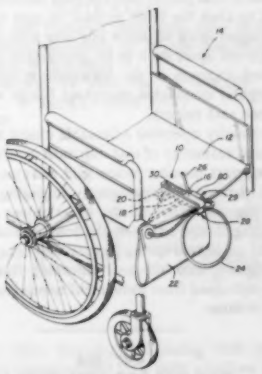
actuating said inlet valve in response to intermittent application of pulses for moving said table upwardly through increments of unit distance or actuating said outlet valve in response to intermittent application of pulses for moving said table downwardly through increments of unit distance.

4,477,046

APPARATUS FOR SUPPORTING A CATHETER DRAINAGE BAG AND TUBE

Mary E. D. Repp, 8560-45 Park La., Dallas, Tex. 75231

Filed Nov. 2, 1982, Ser. No. 438,619
Int. Cl.³ B65B *67/12*
U.S. Cl. 248—95 **1 Claim**



1. A clip for supporting a catheter drainage bag and tube from a chair comprising:

a body formed of a continuous piece of thermoplastic material;

the body including an upper planar elongated arm and a lower planar elongated arm being joined by a 180° bend into a parallel, spaced-apart relationship and being separated by a gap;

the upper arm including a downwardly-facing planar surface, and the lower arm including an upwardly facing surface separated by the gap from the upwardly-facing surface;

the end of the lower arm being curved to form a hook for supporting a catheter drainage bag;

a pair of fingers extending outwardly from the body having opposed planar surfaces being separated by a gap for frictionally engaging at least two sections of a coiled catheter drainage tube associated with the catheter drainage bag; and

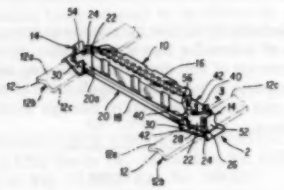
a semi-cylindrical tube straightener attached to the upper arm of the body having a longitudinal axis parallel and spaced apart from the upper arm of the body for maintaining a portion of the catheter drainage tube in a straight and parallel relationship with the clip.

4,477,047

MOUNTING MECHANISM FOR FLANGED ELECTRICAL MODULES AND THE LIKE

Walter J. Pelczarski, Downers Grove, Ill., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 22, 1982, Ser. No. 421,639
Int. Cl.³ A47F *5/00*
U.S. Cl. 248—201 **10 Claims**



1. A mounting clip made of spring material and having a U-shaped clasping portion for engaging the front and rear surfaces of a support member at an edge of said member,

first and second opposed spring fingers integral with said clip extending substantially perpendicularly to the outer surface of that part of said clasping portion which is designated to abut the front surface of said support member, said fingers lying adjacent opposite side edges of said clip and spaced apart such as to springingly engage inwardly directed recesses in the longitudinal side surfaces of a rectangular connector mounting flange when positioned between said fingers,

and a manually operated releasable clamp member integral with that extremity of said clip most remote from the edge of a support member when said clamping portion is engaged thereon for springingly engaging and releasably clamping a portion of the outer upper surface of said mounting flange adjacent the longitudinal end extremity thereof when said spring fingers are engaged in said recesses whereby said clip and mounting flange are substantially restrained from movement relative to one another in all directions.

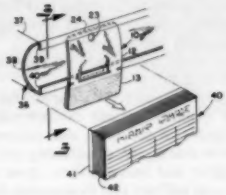
4,477,048

PAD HOLDER AND DISPLAY

Gerald A. Conway, 3133 Fairfax Rd., Cleveland, Ohio 44118

Filed Sep. 21, 1981, Ser. No. 303,897
Int. Cl.³ A47B *23/00*
U.S. Cl. 248—447.1 **14 Claims**

1. A flexible pad holder and display comprising an upper section and a lower section, said upper section including a downwardly projecting tab having a horizontal lower free edge and downwardly extending side edges located inwardly of lateral portions of the upper section at respective sides of the tab, said tab being centrally located between side margins of said upper section and adapted to be flexed to snap the lower free edge into a pricing channel in cooperation with the top edge of the upper section, and the lateral portions pendently supporting the lower section from the upper section and cooperating to resist torsional twisting of the lower section as when a sheet is torn from a pad secured to the lower section.

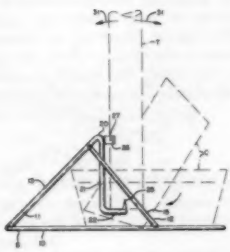


4,477,049

CHRISTMAS TREE STAND

John H. Davis, 3796 Stewart Rd., Eugene, Oreg. 97402

Filed Jul. 26, 1982, Ser. No. 402,128
Int. Cl.³ A47B *33/12*
U.S. Cl. 248—524 **2 Claims**



1. A Christmas tree stand comprising a base ring, a tree holder bar having one end connected to said base ring and an upwardly inclined portion terminating in a downward bend above the center of said base ring, the opposite end of said bar having a free portion extending vertically downwardly from said bend and having a free lower end with an upturned point to secure the end of the tree trunk, a V-shaped bracket mounted at the apex of the V on the upper end of said vertical portion to receive the tree trunk between the arms of the V and having nail holes in said arms to receive nails to be driven into the tree trunk in angular relation, said bar being bendable at said bend by forcefully moving the tree trunk after the trunk has been secured by said upturned point and said nails to compensate for a bend in the tree trunk, an inverted U-shaped support bar having its lower ends connected to said base ring and having an upper portion connected to said inclined portion of said tree holder bar adjacent said bend, said upturned point holding the lower end of said tree trunk above the level of said base ring and said bars providing an open space therebetween to receive a water container for the tree within said base ring.

4,477,050

MULTI-DIRECTIONAL VIBRATION ATTENUATOR SEAT

James E. Thompson; Leonard E. Sandvik, both of Cedar Falls, and Marc A. Elliott, Muscatine, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 24, 1980, Ser. No. 219,900
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—636 **23 Claims**

1. A multi-directional vibration attentuator seat comprising:

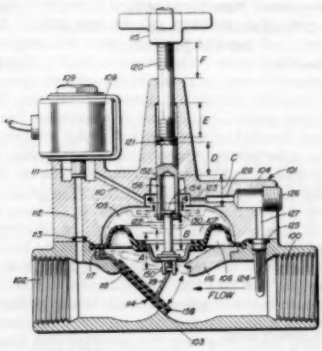
a base assembly;

an intermediate assembly mounted on the base assembly;

a seat assembly mounted on the intermediate assembly;
means for permitting movement of the intermediate assembly relative to the base assembly exclusively along a first axis;

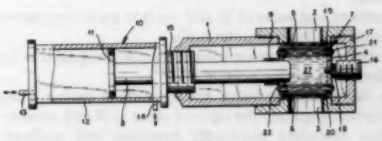
means for permitting movement of the seat assembly relative to the intermediate assembly exclusively along a second axis extending in a different direction from the first axis; and
means for resiliently biasing the seat assembly into a nominal position relative to the first axis and the second axis.

4,477,051
FLOW CONTROL VALVE
Avram Ben-Yehuda, 14924 Greenleaf St., Sherman Oaks, Calif. 91403
Filed May 18, 1982, Ser. No. 379,502
Int. Cl.³ F16K *31/05, 31/145*
U.S. Cl. 251—30 **12 Claims**



1. A valve comprising:
(a) a housing having an inlet and an outlet, a flow passage interconnecting said inlet and said outlet and defining a longitudinal axis therein:
(b) a valve seat in said passage, said valve seat defining a plane which forms an obtuse angle with said longitudinal axis relative to the flow direction from said inlet;
(c) a cavity in said housing in communication with said passage;
(d) a moveable diaphragm disposed across said cavity to define a diaphragm control cavity on one side of said diaphragm, with the other side of said diaphragm in fluid communication with said passage;
(e) control means for varying the fluid pressure in said diaphragm control cavity to control the position of said diaphragm, said control means including fluid passages in said valve housing communicating said control cavity with said flow passage and means for controlling the flow of fluid from said control cavity, said diaphragm being moved outwardly of said control cavity as fluid is introduced into said control cavity, and said diaphragm being moved inwardly into said control cavity as fluid is passed from said control cavity;
(f) a flapper closure element pivotally disposed in said housing and adapted to cooperate with said valve seat to stop flow through said flow passage when said closure element abuts said valve seat, and to permit flow through said flow passage when said closure element is spaced from said valve seat;
(g) means connecting said closure element with said diaphragm such that as said diaphragm is displaced inwardly into said control cavity, said closure element is moved away from said valve seat by said connecting means and said diaphragm to permit fluid flow through said flow passage, and said closure element is moved toward said valve seat by fluid flowing into said passage from said inlet as the diaphragm is displaced outwardly from said control cavity to restrict fluid flow through said fluid passage; and,
(h) means operatively coupled to said diaphragm and said connecting means to permit movement of said closure element away from and towards said valve seat, independently of movement of said closure element by said diaphragm in response to fluid pressure within said control cavity, to provide adjustment of the position of said closure element in the open mode of the valve and to permit opening and closing of the valve independently of the operation of said diaphragm.

4,477,052
GATE VALVE
Karl Knoblauch, and Heinrich Heimbach, both of Essen, Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany
Filed Mar. 18, 1983, Ser. No. 476,683
Int. Cl.³ F16K *31/12*
U.S. Cl. 251—57 **7 Claims**



1. In a gate valve including a housing with an aperture forming part of a throughgoing flow path, a hollow valve body in said housing shiftable between a blocking position aligned with said aperture and an unblocking position away from said flow path, and shutter means on said valve body displaceable in said blocking position into sealing engagement with a seating surface around said aperture by pressure of a fluid confined in said valve body,
the combination therewith of a plunger slidably extending in a fluidtight manner into said valve body for coaction with the fluid confined therein, said plunger being reciprocable in mechanically decoupled relationship with said valve body for driving same from said unblocking position into said blocking position virtually exclusively through the intermediary of the confined fluid, said housing being

provided with stop means for arresting said valve body in said blocking position whereupon a continuing thrust of said plunger displaces the confined fluid to press said shutter means into firm contact with said seating surface, a reverse motion of said plunger enabling withdrawal of said shutter means from said seating surface prior to retraction of said valve body from said blocking position through the intermediary of the confined fluid.

4,477,053

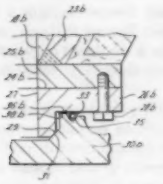
SHUT-OFF VALVE FOR HIGH TEMPERATURE EROSIVE FLOW

Frank J. Jandrasi, Houston, Tex., assignor to General Signal Corp., Stamford, Conn.

Continuation of Ser. No. 352,492, Feb. 25, 1982, , which is a division of Ser. No. 209,090, Nov. 21, 1980,. This application Feb. 6, 1984, Ser. No. 577,637

Int. Cl.³ F16K *1/20*

U.S. Cl. 251—86 **5 Claims**



1. A shut-off valve for high temperature erosive flow comprising,

a body provided with a flow passage through it including an enlarged internal chamber, the downstream end of the flow passage projecting into the enlarged internal chamber,

a valve seat having a valve seating portion disposed in the enlarged internal chamber about and upstream of the downstream end of the flow passage in the enlarged internal chamber,

said valve seating portion projecting from the downstream end of the flow passage and having a tapered outer wall and a surface extending outwardly from said tapered outer wall,

a resilient seal secured to said surface extending outwardly from said tapered outer wall,

a valve member having a seating surface arranged to seat on the valve seating portion,

the valve member valve seating surface having a tapered portion engaging the tapered outer wall and another portion extending outwardly engaging said resilient seal when seating against the valve seating portion,

means disposed in the enlarged internal chamber operable to rotate the valve member to seat the valve seating surface thereof against the valve seating portion to close the valve and to rotate the valve member out of the direct flow through the flow passage to open the valve,

said last-named means including a rotatably mounted shaft disposed in the enlarged internal chamber out of the erosive flow path, and

means connecting the valve to the shaft effective so that rotation of the shaft rotates the valve member to open and close the valve as aforesaid,

whereby, there is an effective shut-off by the valve when closed and the valve seating portion and the valve seating surface are out of the erosive flow path through the valve when the valve is open.

4,477,054

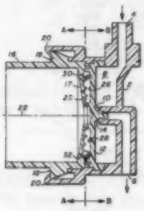
PRECISION VALVE ASSEMBLY

Hal C. Danby, Palo Alto, and Werner W. Ciupke, San Mateo, both of Calif., assignors to Anatros Corporation, San Jose, Calif.

Filed Sep. 30, 1982, Ser. No. 431,312

Int. Cl.³ F16K *31/524, 7/16*

U.S. Cl. 251—122 **11 Claims**



1. A precision valve assembly comprising a valve means and a valve seat means aligned therewith, one of said valve means and valve seat means being mounted on a diaphragm means, at least one ball positioned between opposed track elements which comprise a spiral track having a distal end and a proximal end with respect to a central axis and at least one longitudinal track having a distal end further from said central axis than a proximal end, the distance between the proximal ends of the spiral and longitudinal tracks being less than the outer diameter of the ball when the ball is positioned distally from the central axis, one of said track elements being mounted on the diaphragm means, the ball comprising means for displacing the track mounted on the diaphragm means and the valve element mounted thereon in an axial direction when the tracks are rotated with respect to each other about the central axis and a ball is moved along the tracks.

4,477,055

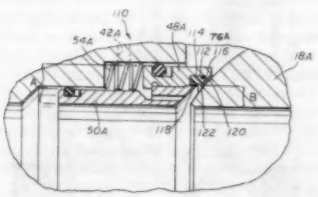
VALVE SEAT FOR BALL VALVES

Charles C. Partridge, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,483

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—174 **14 Claims**



1. A valve comprising:

a valve body having a valve chamber and fluid flow passages therethrough;

a valve member mounted in the valve chamber for movement between an open position and a closed position relative to the fluid flow passages;

an annular valve seat assembly mounted about at least one of the fluid flow passages adjacent the valve chamber for sealing against the valve member, the valve seat assembly having inner and outer seat rings relative to the flow passage, the seat rings being of generally cylindrical form and arranged in concentric juxtaposed relation to each other, and a sealing ring mounted therebetween, the outer

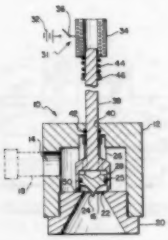
seat ring having a concentric inner groove adjacent an end of the outer seat ring facing the valve member for mounting of the sealing ring therein, the inner seat ring having an outer peripheral frusto-conical portion adjacent the end facing the valve member such that when the two seat rings slidingly engage each other the frusto-conical portion of the inner seat ring engages and deforms the sealing ring mounted in the outer seat ring to provide a protruded annular sealing portion extending beyond the end of the seat rings which sealingly contacts the exterior surface of the valve member.

4,477,056

HIGH FORCE-GAIN VALVE

Richard C. Alexius, Orlando, Fla., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Feb. 28, 1983, Ser. No. 470,810
Int. Cl.³ F16K *39/04*
U.S. Cl. 251—282 **8 Claims**



1. A high force-gain valve for controlling the flow of fluid therethrough comprising:

(a) a housing having first and second openings therein, one of said openings being in fluid communication with a source of said fluid;

(b) a substantially hollow fluid diverter fixed in position within said housing and aligned with said second opening and including elongated slots through a wall thereof;

(c) a gated disposed within said housing closely surrounding said diverter and having a substantially force balanced configuration, said gate being hollow, the interior thereof being in a fluid communication with the interior of said housing thereby facilitating the force balancing thereof, said gate further being translatable between open and closed positions and including a sealing edge sized and shaped for, when said gate is in said closed position, seating against the portion of said housing adjacent said second opening thereby blocking flow of said fluid therethrough, said diverter being attached to said housing on the gate side of and spaced from said second opening so as to provide an unobstructed fluid flow path through said second opening when said gate is in other than said closed position, said slots in said diverter being aligned to the direction of translation of said gate and said gate further including spokes sized for being received in said slots; and

(d) actuation means for effecting translation and positioning of said gate between said open and closed positions.

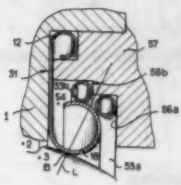
4,477,057

SEALING DEVICE FOR VALVES

Jean Friess, Clermont En Argonne, France, assignor to Matkemi AG, Therwil, Switzerland

Filed Dec. 8, 1981, Ser. No. 328,645
Claims priority, application France, Dec. 12, 1980, 80 26371
Int. Cl.³ F16K *1/22*
U.S. Cl. 251—306 **17 Claims**

1. A sealing device for valves in which provision is made for a main metallic valve seat consisting of a resilient annular closure structure having an outer wall of curled sheet metal, said outer wall having an outer face which is intended to be in contact with the valve element when said element is in the closed position, the device being further provided with means for ensuring leak-tightness between the main seat and the valve body, wherein, in order to decrease the torque and to reduce the friction forces generated by rotation of the valve element, said device further comprises at least one auxiliary seat bearing



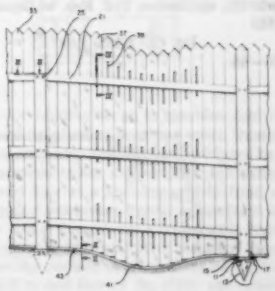
on said outer face of the outer wall and allowing the closure structure of the main seat to bear on the valve body when the valve element is in the closed position, said auxiliary seat being provided with a convex bearing surface for contact with the valve-closure structure and being arranged as a means for guiding the outer wall of the closure structure in a coiling motion thereof.

4,477,058

PLASTIC FENCE

A. J. Lowery, 867 Sandell, White Settlement, Tex. 76108

Filed May 16, 1983, Ser. No. 495,049
Int. Cl.³ E04H *17/14*
U.S. Cl. 256—19 **5 Claims**



1. An improved fence, comprising in combination:

a plurality of posts adapted to be anchored in the ground;

at least two vertically spaced-apart rails extending transversely between the posts;

a plurality of fence boards, each having holes formed therein; and

fastening means extending through the holes in the fence boards for fastening the fence boards to the rail;

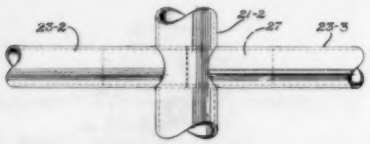
at least some of the holes being elongated vertical slots spaced apart sufficiently to allow the fence boards to be moved vertically with respect to the rails to accommodate uneven terrain.

4,477,059

FENCE

Kenneth R. Willis, Star Rte., Box 85, Eagletown, Okla. 74734

Filed Jun. 30, 1982, Ser. No. 393,541
Int. Cl.³ E04H 17/14
U.S. Cl. 256—65 11 Claims



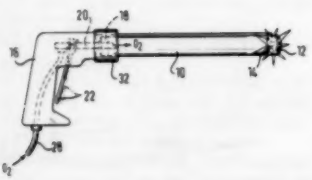
1. A fence comprising:
a post having an aperture formed therethrough transverse to its length,
two hollow rails extending into said aperture from opposite sides of said post with their ends located in said aperture, and
a hollow connecting member located within said two hollow rails for connecting together said two ends of said two hollow rails,
said connecting member having a slit formed through its wall along its length such that said connecting member may be compressed to be located within said two hollow rails,
said connecting member when located within said two hollow rails expanding outward against the walls of said two hollow rails.

4,477,060

UNDERWATER CUTTING TOOL

Lars A. Molinder, Ovre Olskroksgatan 12, S-41667, Goteborg, Sweden

PCT No. PCT/EP82/00227, § 371 Date Jun. 13, 1983, § 102(e) Date Jun. 13, 1983, PCT Pub. No. WO83/01480, PCT Pub. Date Apr. 28, 1983
PCT Filed Oct. 12, 1982, Ser. No. 513,115
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1981, 3141583
Int. Cl.³ B23K 7/00
U.S. Cl. 266—48 9 Claims



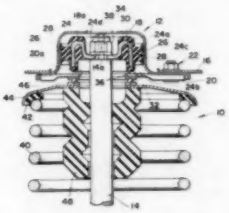
1. An underwater cutting tool comprising in combination
(a) a hand-held base portion flexibly connected to an oxygen source;
(b) a thermal lance attached to said hand-held base portion at one end and having a watertight seal at the opposite cutting end;
(c) said watertight seal formed of an inflammable material;
(d) an igniter unit to ignite and blast off said watertight seal at said cutting end;
(e) said thermal lance sealed at the end opposite the cutting end;
(f) said hand-held base portion having means to pierce the thermal lance at the end opposite the cutting end to allow oxygen to flow into the thermal lance at a pressure greater than the surrounding water pressure.

4,477,061

STRUT TYPE SUSPENSION

Takayoshi Kawaura; Hiroyasu Kan, both of Yokohama, and Yuji Kyoi, Chiba, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 10, 1982, Ser. No. 376,155
Claims priority, application Japan, May 15, 1981, 56-72169
Int. Cl.³ F16F 9/54; B60G 11/54
U.S. Cl. 267—8 R 2 Claims

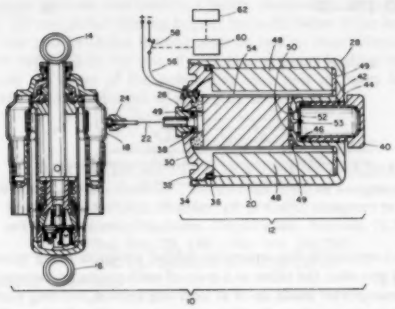


1. A MacPherson strut type suspension for a motor vehicle having vehicle wheels and a vehicle body, comprising:
a shock absorber operatively disposed between the vehicle wheels and the vehicle body, said shock absorber having a piston rod;
a coil spring disposed in association with said shock absorber to elastically support the vehicle body;
a core member secured to an end of said piston rod of said shock absorber, said core member including upper and lower stop sections which are spaced from each other generally in the direction of the core member axis, said core member including a cylindrical section integrally connecting said upper and lower stop sections and arranged coaxially with said shock absorber piston rod;
an insulator rubber securely connected between said core member and the vehicle body, a major portion of said insulator rubber being secured to said core member cylindrical section; and
stop means for restricting the movement of said core member in the axial direction of said piston rod of said shock absorber when an axial movement of said piston rod exceeds a predetermined distance, said stop means including a cooperating casing and cover defining therebetween a space within which said core member is movably disposed, said casing and cover being rigidly mounted to the vehicle body, said casing having a portion located opposite to and separate from said core member upper stop section, said cover having a portion located opposite to and separate from said core member lower stop section, and upper and lower elastic members secured to said core member upper and lower stop sections, said upper elastic member being so located as to form an upper clearance between it and an inner wall surface of said casing, said lower elastic member being so located as to form a lower clearance between it and an inner wall surface of said cover, said upper and lower elastic members being integral with said insulator rubber.

4,477,062
ADJUSTABLE GAS SPRING SHOCK ABSORBER AND CONTROL DEVICE

Paul Smeltzer, Naperville; Mahesh N. Shah, Glendale Heights, and Shapoor B. Guzder, Deerfield, all of Ill., assignors to Maremont Corporation, Carol Stream, Ill.

Filed Jan. 25, 1982, Ser. No. 342,607
Int. Cl.³ F16F 9/46
U.S. Cl. 267—64.28 **10 Claims**



1. A control device for a fluid mechanism containing a variably pressurizable fluid comprising:

a pressurizable vessel;

adsorbent in the vessel, the adsorbency of the adsorbent being variable with temperature;

adsorbate in the vessel of a type adsorbed by the adsorbent;

means associated with the vessel for providing controlled variation of the temperature of the adsorbent and adsorbate such that the means, adsorbent and adsorbate constitute means for providing a controlled variation of adsorbency and thereby pressure within the vessel; and

means operably connecting the vessel to the fluid mechanism for providing a controlled variation of the pressure of the fluid in response to the controlled variation of the pressure within the vessel;

whereby a controlled variation of fluid pressure is provided.

4,477,063
DEVICE FOR HOLDING A WORKPIECE IN POSITION DURING A MACHINING OPERATION, ESPECIALLY A DRILLING OPERATION

Henri Mehier, 18 quai Tilsit, 69002 Lyon, France

Filed Jul. 21, 1981, Ser. No. 285,541
Claims priority, application France, Jul. 25, 1980, 80 16757
Int. Cl.³ B25B 1/00
U.S. Cl. 269—93 **15 Claims**

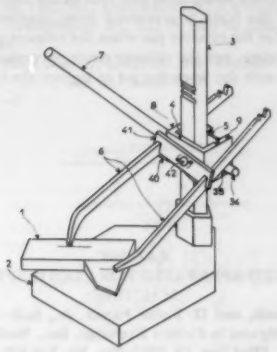
1. A device for locking a workpiece in position on a working plane, the device comprising:

a column to be mounted to extend perpendicularly from such a working plane and a locking assembly slidably displaceable along the column, the locking assembly comprising:

two gripping members positioned in opposed relationship on opposed sides of the column for each gripping member to partially embrace the column;

a pressure member displaceably connected to the gripping members to extend therefrom and to be displaceable relatively thereto; and

displacement means, including a cam, operable by means of a single control lever to displace the two gripping members towards each other to tighten onto the column, and to cause the pressure member to swivel relatively to the

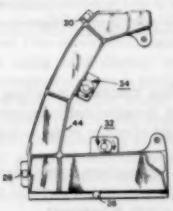


gripping members for locking a workpiece in position on such a working plane.

4,477,064
DEVICE FOR HOLDING WORK IN MACHINE TOOL OPERATIONS

Mario DiGiulio, Spectra Industries Corp., 405 Baily Rd., Yeadon, Pa. 19050

Filed Jun. 9, 1982, Ser. No. 386,700
Int. Cl.³ B25B 1/08
U.S. Cl. 269—231 **1 Claim**



1. A device for holding work in machine tool operations comprising a tooling plate, at least one work locator fixed to the tooling plate and extending outwardly from a face thereof, clamp means, secured to the tooling plate and extending outwardly from said face at a location spaced from said work locator, for urging a workpiece tightly against said work locator, said clamp means comprising a retainer pin having a first part extending into a hole in said plate and fixed thereto, and a second part, having circular cross-sections on a common axis in planes parallel to said face of the plate, and extending outwardly from said face, and a clamp body having a hole fitting said second part, said clamp body being rotatable about said common axis and having camming means for contacting the workpiece and urging the workpiece against the work locator;

wherein the clamp body has a first face lying against said face of the tooling plate, a second face remote from the tooling plate and substantially parallel to said first face, and means comprising two holes for receiving the pins of a wrench for tightening the clamp means, the holes extending from said second face toward said first face, said holes being on opposite sides of the retainer pin; and

wherein said second part of the retainer pin has a shoulder lying against said face of the tooling plate, said first part of the retainer pin is flared outwardly against the wall of said hole in the plate whereby said retainer pin is securely fixed

to said plate, and the second part of the retainer pin extends a short distance beyond the farthest extent of said clamp body away from said face of the tooling plate;

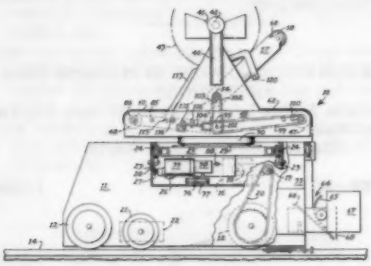
whereby the body is prevented from interfering with the flaring of the retainer pin when the retainer pin is secured to the plate, and the retainer pin is prevented from interfering with the wrench used to tighten the clamp means.

4,477,065

BELT FEED APPARATUS FOR CLOTH SPREADING MACHINE

Hoyt L. Smith, and D. Frank Farrar, Jr., both of Nashville, Tenn., assignors to Cutters Exchange, Inc., Nashville, Tenn.

Filed Sep. 19, 1983, Ser. No. 539,608
Int. Cl.³ B65H *29/46*
U.S. Cl. 270—31 **13 Claims**



1. In a cloth spreading machine including an elongated machine frame movable longitudinally reciprocably over a spreading table and having opposite ends, a cloth feed apparatus, comprising:

(a) standard means on the machine frame adapted to support a cloth supply roll in a mounted position transversely of said frame for free rotary movement,

(b) first belt feeder means comprising a first feeder frame,

(c) said first belt feeder means further comprising a first endless belt carried on said feeder frame for longitudinal movement relative to said first feeder frame,

(d) pivot means pivotally mounting said first feeder frame relative to said standard means for swinging movement of said first belt toward and away from engagement with a supply roll in said mounted position,

(e) said first belt having a discharge end for discharging a web of cloth from said first belt,

(f) second belt feeder means comprising a second feeder frame below said first feeder frame,

(g) a second endless belt carried on said second feeder frame for longitudinal movement relative to said second feeder frame, a portion of said second belt being located vertically below said discharge end of said first belt,

(h) said second belt having a discharge end adjacent one end of the machine frame for discharging a web of cloth carried by said second belt, from said discharge end of said second belt,

(i) means biasing said first feed frame toward a cloth supply roll in mounted position to cause said first belt to engage the periphery of the cloth supply roll,

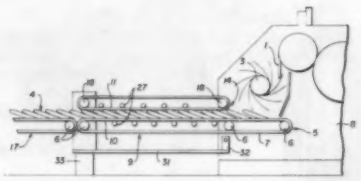
(j) drive means to drive said first belt toward its discharge end and said second belt toward its discharge end.

4,477,066

APPARATUS FOR SEPARATING OVERLAPPED SHEETS OF FOLDED PRODUCTS

Rudolf Fischer, Ludwigshafen-Oggersheim, and Helmut Puschnerat, Worms, both of Fed. Rep. of Germany, assignors to Albert-Frankenthal AG, Fed. Rep. of Germany

Filed Mar. 15, 1983, Ser. No. 475,577
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 3212350
Int. Cl.³ B65H *39/00*
U.S. Cl. 270—52 **18 Claims**



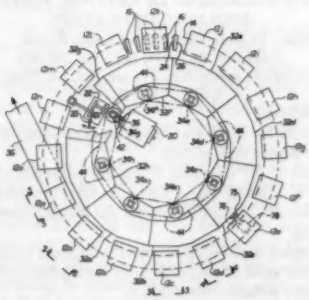
1. An apparatus for separating folded products being transported one after the other as a train of such products, comprising a transporter made up of at least one section, holding parts placed on two sides of said section, means for driving said holding parts along at the same speed as said products on said section, said holding parts being designed for gripping edges of said products on two sides of each product, said edges being edges of sheets within each said folded product which are overlapped with each other in said product in a sideways direction, at least one of said holding parts having a sideways component of motion for pulling at least one overlapped sheet gripped thereby out of said product while at least one other sheet in said product is gripped by said other holding part and said sheets gripped by the two holding parts are pulled generally clear of each other, at least said holding part with said sideways component of motion having moving means walling in a gripping gap for taking up said edges of said sheets nearest thereto, said moving means having a surface speed in step with motion of said products along said section.

4,477,067

METHOD AND APPARATUS FOR ASSEMBLING SHEET MATERIAL ASSEMBLAGES

James C. Wise, Jackson Springs, N.C., assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed May 10, 1982, Ser. No. 376,278
Int. Cl.³ B65H *5/30*
U.S. Cl. 270—55 **22 Claims**



1. A method of assembling newspapers having a jacket and a plurality of inserts in the jacket, said method comprising the steps of providing a pair of adjacent jacket feeding stations

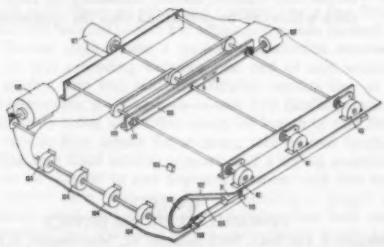
each having a jacket feeding hopper; providing each jacket feeding hopper with a supply of jackets identical to each other; providing a plurality of pairs of adjacent insert feeding stations each having an insert feeding hopper; providing a plurality of pairs of pockets for receiving jackets and inserts from the hoppers at the stations; providing each pair of insert feeding hoppers with a supply of inserts identical to each other; selecting one of two speeds for moving said pockets below said stations; moving the pockets sequentially below the stations at the selected speed; feeding a jacket from one of the hoppers at the pair of jacket feeding stations and an insert from one of the hoppers at each pair of insert feeding stations into one of each pair of pockets; and feeding a jacket identical to the jacket fed by the one jacket feeding hopper from the other of the hoppers at the pair of jacket feeding stations and an insert identical to the insert fed by the one of each pair of insert feeding hoppers from the other of the hoppers at each pair of insert feeding stations into the other of each pair of pockets.

4,477,068

AUTOMATIC DUPLEX DOCUMENT FEEDER

Nelson K. Arter; Dennis C. Estabrooks, both of Longmont, and William G. Jackson, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1982, Ser. No. 393,283
Int. Cl.³ B65H *9/06, 9/16, 29/20*
U.S. Cl. 271—186 **8 Claims**



5. A document feed device for use on a document copier machine comprising:

a document glass platen whereat documents to be copied are viewed for a copying operation;

a reference edge along one side of said document glass;

roller means to move said document sheets across said document glass platen in a first direction, said roller means inclined to the direction of travel of said document sheets to move said sheets into sliding relationship with said reference edge;

an exit tray to receive said document sheets exited from said document glass platen;

turnaround guides to receive said document sheets exited from said document glass platen;

diverter means to selectively divert said document sheets away from said exit tray and toward said turnaround guides;

turnaround feed means to move said document sheets through said turnaround guides and back onto said document glass, said document sheets thereby caused to traverse said document glass in a second direction opposite to said first direction;

roller inclination establishing means for altering said roller inclination to enable said set of rollers to move said document sheets in said second direction without moving said sheets substantially out of sliding relationship with said reference edge; and

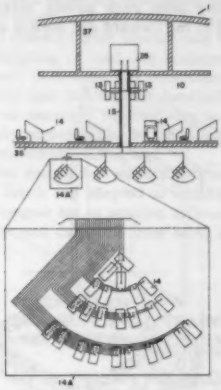
means for selectively positioning said roller inclination establishing means to establish a desired inclination of said set of rollers relative to the direction of sheet travel including a slide bar held within a slot in a fixed bracket, said slide bar containing mounts for shafts upon which said set of rollers are mounted.

4,477,069

ELECTRONIC AMUSEMENT CENTER

Cleveland B. Crudgington, Jr., 222 N. Myrtle Ave., Monrovia, Calif. 91016

Filed Sep. 27, 1982, Ser. No. 424,560
Int. Cl.³ A63J *3/00*
U.S. Cl. 272—3 **8 Claims**



1. An electronic entertainment apparatus including a plurality of consoles, wherein each console includes display means and controls for operation by at least one participant, means for providing a singular entertainment activity shared by all participants operating said controls at said consoles within said electronic entertainment apparatus, wherein other said consoles are at least two in number, means for presenting a perspective view using said display means at each console, wherein said perspective view is particular to each respective participant's viewing position within said singular entertainment activity, means for creating apparent motion of the participant through the continuing alteration of said perspective view, and said apparent motion being manipulated by said participant using said controls on said console, means for presenting said perspective view at each console wherein said perspective view appears three-dimensional and as if said participant(s) at each console were moving within said perspective view, means for representing other said consoles which are within the perspective view displayed at first said console as movable objects or figures, means enabling simultaneous interaction between participants sharing in said singular entertainment activity when said movable objects or figures appear within said perspective view at each of said consoles.

4,477,070

FOLD-AWAY REBOUND EXERCISE DEVICE

Paul Appelbaum, Denver, Colo., assignor to Jog-et, Inc., Englewood, Colo.

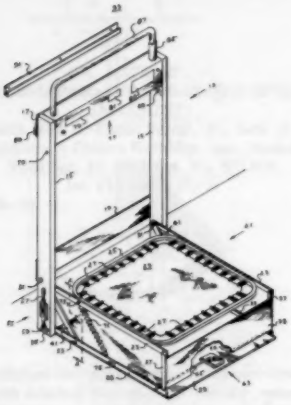
Filed Jul. 29, 1982, Ser. No. 402,912
Int. Cl.³ A63B *23/04, 5/18*
U.S. Cl. 272—70 **3 Claims**

1. Apparatus for in-place jogging which is portable and adapted for mounting to a wall, comprising:

a. housing structure having spaced apart vertically extending side walls defining a storage cavity;

b. a trampoline support structure mounting a taut tramping material and having means for rotatably mounting said support structure to the lower end portion of said housing structure whereby said support structure and mounting

means have a fold-away position completely within the confines of the cavity of said housing and whereby said support structure is rotatable through 90 degrees to a floor position, said trampoline support structure comprising a first support frame that is rotatably mounted at its rear end to locations near the lower extremities of said housing side walls, and a second support frame in which said tramping material is mounted and which is rotatably mounted at its rear end to locations on said housing side walls that are at a higher elevation than and rearward of the mounting locations of said first support frame, and vertically extending linking arms each having bottom ends pivotally mounted to the forward end portion of said first support



frame and having top ends each pivotally mounted to the forward end portion of said second support frame;

c. means for locking said support structure in its fold-away position; and

d. means for locking said support structure in its floor position comprising locking arms that have upper ends pivotally mounted in close proximity to rear end mounting locations of said second support frame, and lower ends that are biased to slidably engage said first support frame as said support structure is moved from its fold-away position to its floor position, said locking arms extending forwardly and downwardly and their lower ends making locking engagement with said first support frame when said support structure is in its floor position.

4,477,071

CONVERTIBLE ROWING EXERCISING APPARATUS

Peter L. Brown, Chelmsford; Patrick C. Fitzpatrick, and Frederick W. Lloyd, both of Harlow, all of England, assignors to Bodytone Limited, Hertfordshire, England

Filed Mar. 14, 1983, Ser. No. 475,189

Claims priority, application United Kingdom, May 25, 1982, 8215026

Int. Cl.³ A63B *21/00, 69/06*

U.S. Cl. 272—72 **20 Claims**

1. A ground-supported physical exercising apparatus capable of use in any of a plurality of orientations, and adapted to be selectively used as a rowing machine or for performing other types of exercises, comprising:

a generally horizontal frame;

at least one pivoted movable lever operatively connected to said frame and having a handle adapted to be grasped and moved by a user's hand;

resistance means operatively coupled to said lever for providing resistance to the movement of said lever;

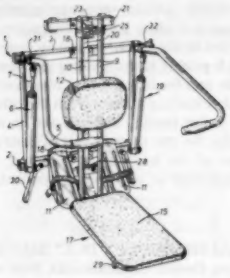
a longitudinal track attached to said frame;

a first user support comprising a seat slidable along said track;

foot bracing means for bracing the user's feet;

ground-engaging auxiliary support means for stably supporting the apparatus with said frame in an upright position;

a second user support; and



attaching means for firmly attaching said second user support to the apparatus adjacent the lower end of and generally perpendicular to said upright frame so that the user can grasp and move said handle while supported on said second user support, thereby increasing the range of exercises which can be performed with the apparatus.

4,477,072

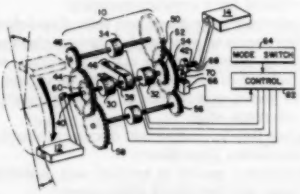
BIMODAL EXERCISE DEVICE

Richard J. DeCloux, 1485 Belmont St., Manchester, N.H. 03104

Filed Sep. 23, 1982, Ser. No. 421,853

Int. Cl.³ A63B *69/00*

U.S. Cl. 272—73 **20 Claims**



20. Apparatus for effecting exercise approximating stand-up pedalling of a bicycle comprising:

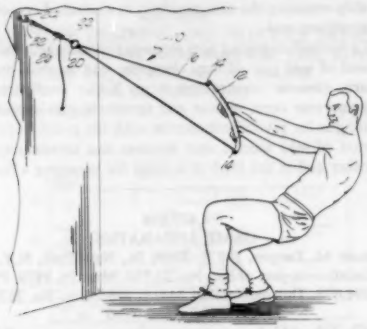
an exercise bicycle including a frame, a seat attached to said frame, a pair of pedals mounted to said frame for rotation about a common axis, braking means, and means coupled to said pedals for driving said braking means; said driving means including means for phasing said pedals such that said pedals are effective to drive said braking means only during a predetermined power stroke in which the relationship between the pedals is other than 180° for a portion of the power stroke, the pedal bearing the power stroke pressure moving through an angle less than 180° during the power stroke, the other pedal moving through an angle greater than 180° during the power stroke, said pedals being returned to a position corresponding to the start of the power stroke when unweighted.

4,477,073

EXERCISE DEVICE FOR BOARDSAILING

Richard K. Koch, and Patricia Koch, both of 923 30th St., San Pedro, Calif. 90731

Continuation-in-part of Ser. No. 334,733, Dec. 28, 1981, abandoned. This application May 17, 1982, Ser. No. 378,758
Int. Cl.³ A63B 7/00
U.S. Cl. 272—93 9 Claims



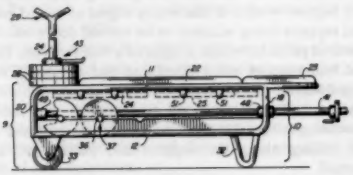
1. An exercise device adapted to be secured to a fixed anchor support for developing the muscles used while boardsailing, said device comprising: an elongated gripping bar; a first flexible tension line secured to said bar adjacent the ends thereof; a second flexible tension line; a tension transmission member secured to and extending between one end of said second flexible tension line and said first flexible tension line at a location intermediary of the ends of said first flexible tension line, said means being adjustable along the length of said first flexible tension line; means for securing said second flexible tension line to a fixed anchor support; and a spring assembly adapted to be secured to and disposed between said first and second tension lines, said assembly comprising a length of elastic shock cord, said length of cord being bent back and forth upon itself and about said tension transmission member to define a first plurality of extended loops adapted to be secured to said second flexible transmission line and a second plurality of loops disposed about said tension transmission member and means for maintaining said loops in said cord.

4,477,074

PORTABLE BARBELL AND DUMBBELL RACK

Donald D. Bushnell, 733 S. Jones, Mesa, Ariz. 85204

Filed Jul. 12, 1982, Ser. No. 397,126
Int. Cl.³ A63B 13/00
U.S. Cl. 272—123 1 Claim



1. Bench press apparatus for assisting an individual in lifting a barbell, said bench press apparatus comprising, in combination,

(a) a frame;

(b) an elongate generally horizontally disposed bench carried on said frame for supporting an individual reclining on said apparatus;

(c) a pair of spaced upstanding rods carried and positioned on said frame such that a portion of said support bench lies thereinbetween, said rods having upper ends provided with barbell support surfaces, said support surfaces being shaped, contoured and dimensioned such that a barbell may be maintained in position above said support bench;

(d) at least one dumbbell carried by said frame beneath said bench and including an elongate dumbbell rod

(e) means for maintaining said at least one dumbbell in position on said frame beneath said bench such that

(i) said at least one dumbbell rod is generally parallel to said support bench, and

(ii) said at least one dumbbell rod can be upwardly displaced from said means for maintaining said at least one dumbbell in position on said frame beneath said bench and may be removed from beneath said bench,

said means including at least one horizontally disposed member shaped, contoured and dimensioned to at least partially engage said at least one dumbbell and prevent said at least one dumbbell from moving in a direction of travel generally perpendicular to the longitudinal axis of said at least one dumbbell rod; and,

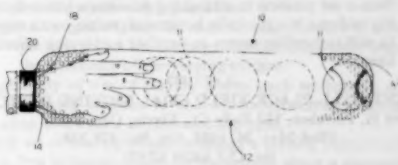
(f) securing means mounted on said frame beneath said elongate support bench and adapted to slidably receive and secure said elongate bar in position above said dumbbell rod to prevent said dumbbell from being upwardly displaced.

4,477,075

PLAYER WORN BALL RETRIEVAL/TRAINING DEVICE

J. Frederich L. Outman, 10705 Tesshire Dr., St. Louis, Mo. 63123

Filed May 26, 1981, Ser. No. 267,418
Int. Cl.³ A63B 69/00
U.S. Cl. 273—26 C 12 Claims



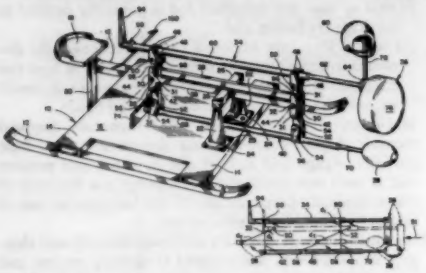
1. A player worn practice/training device for use in the overhanded throwing of a baseball, softball or football comprising a strapless elongated flexible sleeve-like member having first and second end portions and an intermediate sleeve-like portion extending therebetween and defining an internal passageway therein between said first and second end portions, said first end portion including an opening therethrough, said elongated member being internally dimensioned to receive therein adjacent said first end portion a ball to be thrown and at least the hand of the player gripping such ball, fastening means associated with said first end portion for removably securing said device to the arm of the player, said second end portion being longitudinally spaced from said first end portion a length sufficient to permit the ball being gripped within such member by a player to be released and to move beyond the player's hand a distance greater than the longitudinal axis of such ball, said intermediate portion having a lateral internal circumference greater than the lateral circumference of such ball and less than essentially twice the lateral circumference of a regulation size baseball, regulation size softball, or regulation size football such that when the player performs an overhanded throw and releases the ball such ball can freely and easily traverse the length of said internal passageway, and means associated with said second end portion to substantially close said passageway to facilitate the stopping and retention of the ball being used therewith when thrown in the device, said device being constructed substantially entirely of a soft lightweight durable material which is foldable for storage in a small space.

4,477,076

DEFENSIVE REACTION FOOTBALL BLOCKING DEVICE

Robin Monaco, 97 Fans Rock Rd., Hamden, Conn. 06518

Filed Apr. 16, 1981, Ser. No. 254,957
Int. Cl.³ A63B 69/00
U.S. Cl. 273—55 R 23 Claims



1. A football blocking device for training defensive linemen to react to the snap of a football and to a charging offensive lineman, the device comprising:

at least one blocking dummy;

an elongate ram having said blocking dummy mounted on an end portion thereof;

a ball object positioned adjacent said blocking dummy; and

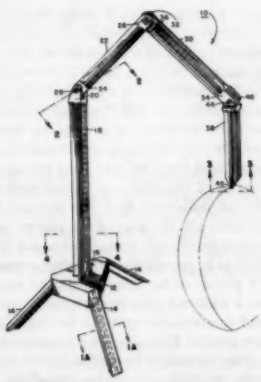
means for supporting said elongate ram and said ball object including pivot means pivotally operable on said elongate ram and said ball object for simultaneously moving said ball object rearwardly to simulate the snap of the football and said blocking dummy forwardly and downwardly from a set position to a blocking position while maintaining said ram in a generally horizontal position with respect to said supporting means to simulate a charging offensive lineman.

4,477,077

FOOTBALL PLACE/FIELD GOAL KICKING DEVICE

David H. Ferrebee, 122 Eady Ct., Elyria, Ohio 44035

Filed Mar. 24, 1983, Ser. No. 478,234
Int. Cl.³ A63B 67/00
U.S. Cl. 273—55 B 3 Claims



1. A football kick training device comprising:

(a) a support base including an aperture centrally located thereon, said aperture having an X-like configuration;

(b) an elongated support post constructed in an X-like configuration in transverse cross section, and terminating at one end in a groove type configuration and having a circular aperture on said groove ending;

(c) a first and a second arm element, each arm element constructed in an X-like configuration in transverse cross section and terminating at one end in a groove type configuration and at the other end in a tongue like configuration, the tongue configuration of said first arm element being pivotally connected within the groove configuration of said support post, the groove configuration of said first arm element pivotally connected to the tongue configuration of said second arm element, and said arm elements having means at said pivotal connections for adjustably retaining the arm members in a selected one of plural positions; and

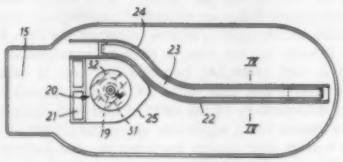
(d) a football engaging arm element pivotally secured to one end of said pair of arm elements, said football engaging arm element constructed in an X-like configuration in transverse cross section and terminating at one end in a tongue for pivotal connection with the groove configuration of said second arm element and terminating at its other end in the form of a taper for engaging a football.

4,477,078

GAME APPARATUS

Abraham M. Torgow, 185 E. 206th St., New York, N.Y. 10458

Continuation-in-part of Ser. No. 23,730, Mar. 26, 1979, Pat. No. 4,264,073. This application Jan. 2, 1981, Ser. No. 222,667
Int. Cl.³ A63F 7/30
U.S. Cl. 273—122 A 6 Claims



1. Apparatus, for playing a game, comprising:

(i) an elongated structure with an upper wall extending in the direction from a first end to a second end and forming a top playing surface, said upper wall having therein at least one first opening and a plurality of second openings all dimensioned to permit passage of a ball rolled along said playing surface, and an upstanding wall bounding said top playing surface at least at said second end,

(ii) an elongated ball guiding means disposed below said playing surface and extending towards said first end, said guiding means including a chute portion positioned below said at least one opening and inclined to cause a ball, dropping onto said chute portion, to roll therealong towards said first end, said ball guiding means including a ball support which is resiliently urged to raised position, said support being adapted to be moved downwardly to a lowered position by the weight of a ball received thereon, said ball support being elongated and extending along a major portion of the length of said chute portion such that when a ball is received on said support it is moved to lowered position for a period of time determined by the ball rolling along the support and passing off an end thereof,

(iii) switch means associated with said ball support and arranged to be open when said ball support is not in lowered position, and to be closed when said ball support is not in raised position,

(iv) an indicator coupled for actuation by an electric powered device, said indicator including indicator rotor elements rotatable about a common axis and frictionally drivable one from another,

(v) electrical wiring connecting said switch means and said electric powered device and terminals for connection to a current source such that a current circuit is completed to

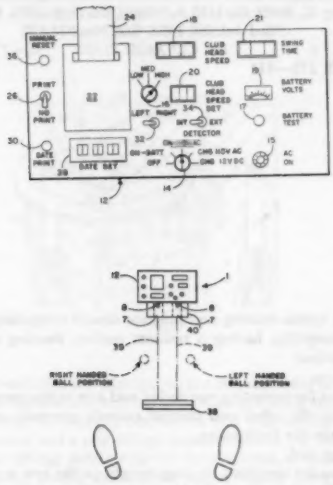
said electric powered device when said switch means is closed by the presence of a ball rolling on said support.

4,477,079

GOLF SWING TRAINING AND PRACTICE DEVICE

Arthur A. White, P.O. Box 10396, Santa Ana, Calif. 92711

Filed Aug. 16, 1982, Ser. No. 408,300
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—186 R **19 Claims**



1. A golf swing practice device including means for measuring the speed at which a golfer swings his club through a measuring zone, said practice device comprising:

at least two optical detectors, the respective optical axes of which defining opposite ends of the measuring zone, the first of said optical detectors being activated when the golfer's club enters the measuring zone and the second of the optical detectors being activated when the golfer's club exits the measuring zone,

means by which to supply said optical detectors with respective beams of light,

computational means interfaced with said optical detectors to measure the elapsed time between the respective activations thereof, said computational means being adapted to provide an indication of the speed at which the golfer swings his club through the measuring zone depending upon said elapsed time and distance between the optical axes of said detectors,

display means interfaced with said computational means for displaying the indication of the measured speed at which the golfer swings his club through the measuring zone,

switch means interfaced with said computational means by which a golfer can select a particular speed to achieve when swinging his club through the measuring zone, and

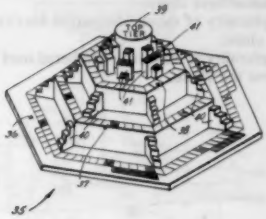
comparator means by which to compare the golfer's selected club speed with his measured club speed, so that an indication can be provided by which to inform the golfer as to whether or not his measured club speed has surpassed his selected club speed.

4,477,080

BOARD GAME DEVICE HAVING PLURAL TIERS

Bruce W. Baker, Clarksville Rd., Clarksville, Ohio 45113

Filed Dec. 20, 1982, Ser. No. 451,064
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—241 **11 Claims**



9. A board game device comprising:

a game board having a playing surface, the playing surface having a center and a perimeter, the playing surface including

(a) a plurality of segmented endless paths, the segmented endless paths each being generally concentric with the center of the playing surface,

(b) a plurality of interconnecting paths interconnecting adjacent segmented endless paths,

(c) a plurality of center interconnecting paths interconnecting the center and the segmented endless path nearest the center, each of such center interconnecting paths bearing an identifying indicium,

(d) a designated start for each set of a plurality of sets of playing pieces on the segmented endless path nearest the perimeter of the playing surface,

a plurality of sets of playing pieces, each set bearing a set identifying indicium for that set corresponding to an indicium of a center interconnecting path,

each set of playing pieces including a playing piece bearing a first indicium means for movement about a segmented endless path only in a clockwise direction, a playing piece bearing a second indicium means for movement about a segmented endless path only in a counter-clockwise direction, and a playing piece bearing a third indicium means for movement about a segmented endless path in either a clockwise or counter-clockwise direction, and

means for random selection of a number,

a playing piece of a set placed at a designated start being advanced about a segmented endless path and between segmented endless paths via the interconnecting paths, the playing piece moving along such paths in correspondence to the permitted movement of such piece and in correspondence to a randomly selected number, the ultimate object of the game to advance an entire set of such pieces to the center via the center interconnecting path for that set.

4,477,081

BOARD GAME WITH NUMBER SELECTION DEVICE

Walter R. Crosby, 78 S. Washington Ave., Centereach, N.Y. 11720

Filed Jan. 31, 1983, Ser. No. 462,309
Int. Cl.³ A63F *3/00, 9/00*
U.S. Cl. 273—251 **9 Claims**

1. A board game apparatus, comprising:

(a) a board acting as a playing field and containing on one side an outline map of the United States of America,

(b) a track winding across the map between New York and Los Angeles,

(c) a single playing piece for each player to be used in accor-

dance with the rules of the game in which the piece is moved along the track,

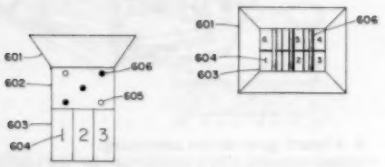
(d) a plurality of spaces along the track containing indications of location and instructions to be followed when a player's playing piece lands on a space containing such instructions, and

(e) a number selection device to determine the number of spaces each player moves along the track, comprising:

(i) a funnelform chute,

(ii) a plurality of moveable, partial barriers positioned in the chute,

(iii) a plurality of miniature numbered mail bins positioned below the chute,



(iv) a miniature mail bag,

(v) a plurality of uniformly identified miniature letters, initially positioned in the miniature mail bag,

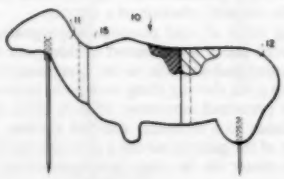
(vi) a single miniature letter having a special identification which differs from those in subparagraph (v) above and which is positioned initially in the miniature mail bag where it is mixed with the letters of subparagraph (v) by shaking the bag, all letters in the bag then being emptied into the chute, passed randomly through the barriers, and into one of the numbered mail bins, the number of the bin into which the special letter falls determining a selected number that is typically used to indicate the number of spaces moved by a player.

4,477,082

ARCHERY TARGET WITH REPLACABLE TARGET SEGMENT

Larry G. McKenzie, P.O. Box 480, Granite Quarry, N.C. 28072, and Leon T. Powell, Rte. 13, Box 52, Salisbury, N.C. 28144

Filed Dec. 6, 1982, Ser. No. 447,432
Int. Cl.³ F41J 3/00
U.S. Cl. 273—403 **11 Claims**



7. A three-dimensional archery target simulating the shape of an animal and having a replacable segment for use with broadhead arrows and comprising:

(a) First and second body segments, said first body segment having a shape simulating the forward extremity of an animal and said second body segment having a shape simulating the rearward extremity of an animal;

(b) a replacable target segment having a shape corresponding to the central trunk of a corresponding animal for being matingly and detachably positioned between said first and second body segments to collectively define the entire body portion of a corresponding animal; said target segment being comprised of a lightweight, semi-rigid, tangle-free and non-healing foam material adapted for controlled disintegration from arrow impact and from which broadhead arrows can be withdrawn without damage to the arrowhead or shaft, wherein said target segment comprises a foam having a relatively high density and said first and second body segments have a relatively lower density in order to enable the replacable target segment to withstand the impact of arrows for a longer period;

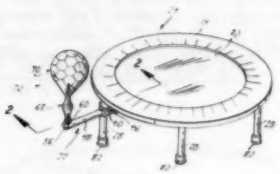
(c) Means for releasably retaining said target segment between said first and second body segments in resistance to force in one direction caused by the impact of arrows thereon and to force in the opposite direction caused by removal of arrows.

4,477,083

SPORTS TRAINING AND PRACTICE DEVICE

Gregory E. Sowards, 1415 S. Maple, Carthage, Mo. 64836

Filed Jul. 29, 1983, Ser. No. 518,639
Int. Cl.³ A63B 71/02
U.S. Cl. 273—411 **18 Claims**



1. A sports training and practice device comprising:

a trampoline having a resilient surface forming a playing surface;

an arm;

means for mounting one end of said arm to the trampoline so that the other end thereof extends generally outwardly from the trampoline;

a bag; and,

means for mounting the bag upright on the arm in a position where it can be kicked by a player located on the playing surface.

4,477,084

VANE STRUCTURE FOR ARROWS

Charles W. Austin, 4330 NE. 38th St., Des Moines, Iowa 50317

Filed Mar. 7, 1983, Ser. No. 473,083
Int. Cl.³ F41B 5/02
U.S. Cl. 273—423 **1 Claim**

1. An arrow vane, comprising:

an elongated base portion, and

an elongated solid fin integrally formed with and extending outwardly from said base portion,

said fin having a corrugated construction and at least one elongated opening formed therethrough,

said corrugated construction comprising a plurality of angularly disposed corrugations consisting of intermittent elongated parallel thick and narrow portions with at least the thick portion being arcuate in shape,

said corrugations being at a fourth-five degree angle with respect to said base portion,

said opening having V-shaped edges.

4,477,085

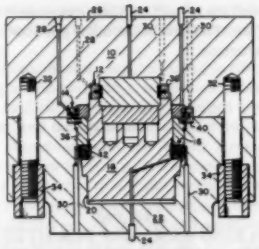
FIRE RESISTANT CONNECTIONS EMBODYING HEAT TRANSFER MEANS

Charles D. Bridges; Michael A. Karr, Jr., and Bert L. Morrison, all of Houston, Tex., assignors to Gray Tool, Houston, Tex.

Filed Feb. 24, 1983, Ser. No. 469,355

Int. Cl.³ F16J *15/06*

U.S. Cl. 277—22 **9 Claims**



1. In a connection for effectuating the establishment of a fire resistant connection and seal between mating sealing surfaces, the connection including a continuous seal ring having a rib formed thereon and a pair of legs depending from the rib such that the pair of legs define a cavity therebetween, a first and a second mating sealing surface, the improvement comprising heat transfer means cooperatively associated with the connection, said heat transfer means including a first heat transfer element and a second heat transfer element, said first heat transfer element having a configuration complementary to the configuration of the cavity formed in the continuous seal ring, said first heat transfer element being supported in the cavity formed in the continuous seal ring, said second heat transfer element including a base and a rib upstanding from said base, said second heat transfer element having a substantially inverted T-shaped configuration, said second heat transfer element being supported in juxtaposed relation to the continuous seal ring with said upstanding rib of said second heat transfer element in engagement with said first heat transfer element and with said base of said second heat transfer element in engagement with the free ends of the pair of legs of the continuous seal ring such that said first heat transfer element is operative to enhance the heat transfer between the continuous seal ring and the first and second mating sealing surfaces and said second heat transfer element is operative to enhance the heat transfer between said first heat transfer element and the first and second mating sealing surfaces.

4,477,086

SEAL RING WITH SLIDABLE INNER ELEMENT BRIDGING CIRCUMFERENTIAL GAP

Ernest Feder, West Hartford, and Claude E. Thibeault, Wethersfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

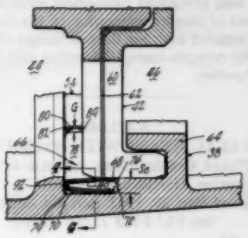
Filed Nov. 1, 1982, Ser. No. 438,541

Int. Cl.³ F16J *15/08*

U.S. Cl. 277—26 **18 Claims**

1. A seal ring of the type which is free standing, circumferentially continuous, and adapted to extend between two circumferentially extending structures, which comprises:

a first circumferentially extending element which has a first end and a second end spaced circumferentially from the first end leaving a circumferential gap G therebetween, and



a second element extending across the gap G which extends past the first end and is attached to the first element and which extends past the second end and slidably engages the first element to form a continuous ring which is capable of expanding or contracting in response to operative temperatures, pressure and loads.

4,477,087

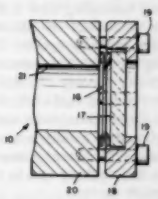
SEAL FORMED OUT OF A HARD METAL WITH A PLATING OF SOFT METALS

Leroy V. Sutter, Jr., 6301 Summertime La., Culver City, Calif. 90230, and Harold A. Cameron, 635 W. Baker St., M-103, Costa Mesa, Calif. 92626

Filed Jul. 20, 1983, Ser. No. 516,123

Int. Cl.³ F16J *15/08*

U.S. Cl. 277—26 **3 Claims**



1. An improved seal for use in sealing a gas laser system which includes:

a. an elongated cylindrical chamber which is formed from a ceramic material and which has an axis, a first open end and a flat circular peripheral edge adjacent to said first open end;

b. a reflector mount which is a circular member having has a flat surface which is substantially coaxially aligned with said axis and which is disposed adjacent, but not contiguous, to said flat circular peripheral edge of said elongated cylindrical chamber; and

c. coupling means for mechanically coupling said flat surface of said reflector mount to said first open end of said elongated cylindrical chamber wherein said improved seal is inserted between said flat surface of said circular member and said flat circular peripheral edge of said elongated cylindrical chamber and said coupling means applies a compressive force, said improved seal comprising:

a. an annular member having an outer surface and being formed from titanium which is relatively non-deformable by said compressive force, said annular member having a substantially circular cross-section, said annular member

also having a slot which is disposed orthogonally to said axis and adjacent to its outer peripheral edge; and

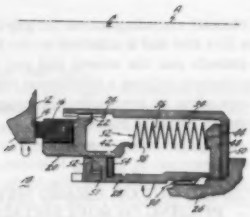
b. a plating of gold which is mechanically coupled to said outer surface of said annular member wherein said plating of gold is deformable by said compressive force so that said plating of gold forms a seal between said flat surface of said circular member and said flat circular peripheral edge of said elongated cylindrical member whereby the coefficient of thermal expansion of titanium forming said annular member matches the coefficient of thermal expansion of the ceramic material forming said elongated cylindrical chamber.

4,477,088

FACE SEAL MEANS WITH BACK-UP SEAL

Harrison R. Picard, Granby, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 20, 1982, Ser. No. 451,643
Int. Cl.³ F16J *15/36, 15/38*
U.S. Cl. 277—83 **2 Claims**



1. Sealing means for a bearing compartment of a twin spool gas turbine engine having a seal plate rotating at a first speed, an annularly shaped carbon seal having a face bearing against said seal plate in sealing relationship and rotating at a second speed relative to said first speed, an annular support means carrying said carbon seal including first and second annular members having an anti-rotational tab allowing axial movement, a concentric sleeve radially spaced from said second annular member defining therewith an annular cavity, a bellows disposed in said cavity having one end bearing against said first annular member to load said carbon seal against said seal plate, a back-up seal disposed between said carbon seal and said bellows and being located axially and radially outward from said carbon seal and attachment means for connecting said carbon seal, bellows and back-up seal to one of said spools for imparting rotary motion thereto.

4,477,089

HONEYCOMB SEAL FOR TURBINE ENGINES

Paul L. Hoffman, Stratford, and Joseph C. Manente, Jr., Monroe, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Jul. 26, 1982, Ser. No. 401,926
Int. Cl.³ F16J *15/28, 15/40*
U.S. Cl. 277—153 **11 Claims**

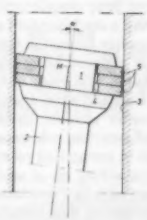
1. A seal for minimizing gas leakage between the rotor and stator assemblies of a turbine engine, said seal comprising a plurality of substantially identical metallic rings, each said ring having a pair of opposed sides and a plurality of radially extending convolutions disposed thereabout defining alternating ridges and valleys, such that each said convolution defines a ridge with respect to one said side of said ring and a valley with respect to the opposed side of said ring, the distance between adjacent convolutions on each said ring increasing linearly with the distance from the center of said ring, and the amplitude of each said convolution being substantially constant along its entire radial length, said plurality of rings being fixedly arranged with their respective centers being substantially colinear and with the ridges on facing sides of adjacent rings being in abutting relationship along substantially their entire radial length such that the valleys between adjacent pairs of abutting ridges define a radially extending cell, a plurality of said abutting ridges being fixedly secured to one another such that said rings define a tubular honeycomb structure having radially aligned cells, whereby the attachments of said ridges to one another are substantially free of compression at the inner portions of said tubular honeycomb structure and substantially free of tension at the outer portions of said tubular honeycomb structure.

4,477,090

PISTON RING ASSEMBLY FOR HYDRAULIC MECHANISMS, PARTICULARLY SUCH MECHANISMS FOR VERY HIGH OPERATING PRESSURES

Ingvar Johansson, Storlyckevägen 6, S-463 00 Lilla Edet, and Hans A. Sterner, Petersbergsvägen 73, S-462 00 Vänersborg, both of Sweden

Filed Jun. 6, 1983, Ser. No. 501,333
Claims priority, application Sweden, Jun. 4, 1982, 8203485
Int. Cl.³ F16J *9/16, 15/44*
U.S. Cl. 277—174 **2 Claims**



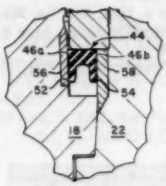
1. A piston ring assembly for a piston which is rigidly connected to an associated piston rod and which during its reciprocating motion in a cylinder has its longitudinal axis inclined through a small angle relative to the center axis of said cyliner, said piston being intended for use in hydraulic mechanisms with very high hydraulic fluid pressures such as axial piston machines, said piston being provided with a peripheral groove for accommodating a sealing piston ring assembly, said ring assembly comprising: a plurality of annular and radially slitted metal washers each having a cylindrical outer peripheral surface and a thickness relative to the cylinder diameter such that the width of the radial slit is substantially equal to zero at an intermediate value of the inclination angle between the longitudinal axis of the piston and the center axis of the cylinder; and, a piston groove having a depth sufficient to allow free relative sliding motion between said washers without obstructing the inclining movements of the piston in the cylinder.

4,477,091

FIRE RESISTANT CONNECTIONS AND U-LIKE SEALING MEANS THEREFOR

Frank C. Adamek, Pasadena, Tex., assignor to Gray Tool Company, Houston, Tex.

Filed Feb. 24, 1983, Ser. No. 469,356
Int. Cl.³ F16J 15/08
U.S. Cl. 277—211 6 Claims



1. A connection for effectuating the establishment of a fire resistant connection and seal between mating sealing surfaces comprising:

(a) a continuous seal ring including a rib formed thereon having a first end and a second end, said rib lying in a plane, said rib having a first enlarged portion formed at said first end thereof so as to project outwardly to a slight extent therefrom, said rib further having a second enlarged portion formed at said second end thereof so as to project outwardly to a slight extent therefrom, said continuous seal ring further including a first leg depending from said first end of said rib and a second leg depending from said second end of said rib, said first leg lying in a plane extending perpendicular to said plane of said rib, said second leg lying in a plane extending parallel to said plane of said first leg and perpendicular to said plane of said rib, said first leg having a seal lip formed adjacent to the free end thereof so as to project outwardly therefrom to a slight extent on the external surface thereof, said seal lip of said first leg terminating in a planar sealing surface, said second leg having a seal lip formed adjacent to the free end thereof so as to project outwardly therefrom to a slight extent on the external surface thereof, said seal lip of said second leg terminating in a planar sealing surface;

(b) a first mating sealing surface having a first portion embodying a configuration complementary to the configurartion of said planar sealing surface of said seal lip of said first leg, said first mating sealing surface further having a second portion embodying a configuration complementary to the configuration of said first enlarged portion formed at said first end of said rib;

(c) a second mating sealing surface having a first portion embodying a configuration complementary to the configuration of said planar sealing surface of said seal lip of said second leg, said second mating sealing surface further having a second portion embodying a configuration complementary to the configuration of said second enlarged portion formed at said second end of said rib; and

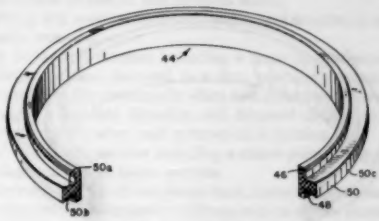
(d) said continuous seal ring when positioned relative to said first and second mating sealing surfaces for purposes of effectuating the establishment of a fire resistant connection and seal therewith having said planar sealing surface of said seal lip of said first leg positioned in sealing engagement with said first portion of said first mating sealing surface, said planar sealing surface of said seal lip of said second leg positioned in sealing engagement with said first portion of said second mating sealing surface, said first enlarged portion of said rib engaging said second portion of said first mating sealing surface, said second enlarged portion of said rib engaging said second portion of said second mating sealing surfaces.

4,477,092

FIRE RESISTANT CONNECTIONS AND DOVETAIL-LIKE SEALING MEANS THEREFOR

Robert E. Bush, Houston, Tex., assignor to Gray Tool Company, Houston, Tex.

Filed Feb. 24, 1983, Ser. No. 469,357
Int. Cl.³ F16J 15/08
U.S. Cl. 277—211 6 Claims



1. A connection for effectuating the establishment of a fire resistant connection and seal between mating sealing surfaces comprising:

(a) a continuous seal ring including a base having a first face and a second face, a first seal lip formed integrally with said base so as to project outwardly to a slight extent from said first face of said base adjacent to one end of said base, said first seal lip terminating in a planar sealing surface, a second seal lip formed integrally with said base so as to project outwardly to a slight extent from said first face of said base adjacent to the other end of said base, said second seal lip terminating in a planar sealing surface, said planar sealing surface of said first seal lip and said planar sealing surface of said second seal lip each lying in the same plane, a rib formed integrally with said base so as to project outwardly from said first face of said base at a location therealong substantially equidistant from said first seal lip and said second seal lip said rib terminating in a planar surface at the free end thereof, said rib having a first tapered side narrowing towards said base, said rib further having a second tapered side narrowing towards said base, said first tapered side and said second tapered side of said rib being operative to provide said rib with a dovetail-like configuration;

(b) a first mating sealing surface having a first portion embodying a configuration complementary to the configuration of said planar sealing surface of said first seal lip, said first mating sealing surface further having a second portion embodying a configuration complementary to the configuration of said first tapered side of said rib;

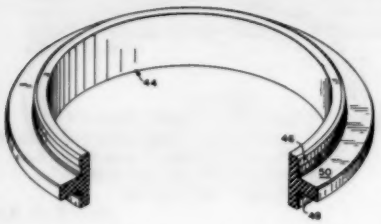
(c) a second mating sealing surface having a first portion embodying a configuration complementary to the configuration of said planar sealing surface of said second seal lip, said second mating sealing surface further having a second portion embodying a configuration complementary to the configuration of said second tapered side of said rib; and

(d) said continuous seal ring when positioned relative to said first and second mating sealing surfaces for purposes of effectuating the establishment of a fire resistant connection and seal therewith having said planar sealing surface of said first seal lip positioned in sealing engagement with said first portion of said first mating sealing surface, said planar sealing surface of said second seal lip positioned in sealing engagement with said first portion of said second mating sealing surface, said rib clamped in interposed relation with said first and second mating sealing surfaces and with said first tapered side of said rib engaging said second portion of said first mating sealing surface and said second tapered side of said rib engaging said second portion of said second mating sealing surface.

4,477,093
FIRE RESISTANT CONNECTIONS AND T-LIKE SEALING MEANS THEREFOR

Frank C. Adamek, Pasadena, Tex., assignor to Gray Tool Company, Houston, Tex.

Filed Feb. 24, 1983, Ser. No. 469,358
Int. Cl.³ F16J *15/08*
U.S. Cl. 277—211 6 Claims



1. A connection for effectuating the establishment of a fire resistant connection and seal between mating sealing surfaces comprising:

a. a continuous seal ring including a base having a first face and a second face, a first seal lip formed integrally with said base so as to project outwardly to a slight extent from said first face of said base adjacent to one end of said base, said first seal lip terminating in a planar sealing surface, a second seal lip formed integrally with said base so as to project outwardly to a slight extent from said first face of said base adjacent to the other end of said base, said planar sealing surface of said first seal lip and said planar sealing surface of said second seal lip each lying in the same plane, a rib formed integrally with said base so as to project outwardly from said first face of said base at a location therealong substantially equidistant from said first seal lip and said second seal lip, said rib having a first face lying in a plane extending perpendicular to said plane of said planar sealing surface of said first seal lip and of said planar sealing surface of said second seal lip, said rib further having a second face lying in a plane extending parallel to said plane of said first face of said rib and extending perpendicular to said plane of said planar sealing surface of said first seal lip and of said planar sealing surface of said second seal lip;

b. a first mating sealing surface having a first portion embodying a configuration complementary to the configuration of said planar sealing surface of said first seal lip, said first mating sealing surface futher having a second portion embodying a configuration complementary to the configuration of said first face of said rib;

c. a second mating sealing surface having a first portion embodying a configuration complementary to the configuration of said planar sealing surface of said second seal lip, said second mating sealing surface further having a second portion embodying a configuration complementary to the configuration of said second face of said rib;

d. said continuous seal ring when positioned relative to said first and second mating sealing surfaces for purposes of effectuating the establishment of a fire resistant connection and seal therewith having said planar sealing surface of said first seal lip positioned in sealing engagement with said first portion of said first mating surface, said planar sealing surface of said second seal lip positioned in sealing engagement with said first portion of said second mating surface, said rib clamped in interposed relation with said first and second mating sealing surfaces and with said first face of said rib engaging said second portion of said first mating sealing surface and said second face of said rib engaging said second portion of said second mating sealing surface.

4,477,094
GASKET AND METHOD FOR HIGH-TEMPERATURE AND HIGH PRESSURE APPLICATION

Tsutomu Yamamoto; Masaaki Ashizawa; Kazuo Nishimoto, and Yuji Sekiguchi, all of Yokohama, Japan, assignors to Nichias Corporation, Tokyo, Japan

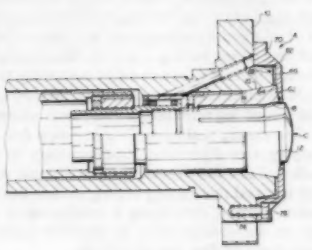
Filed May 6, 1981, Ser. No. 261,051
Claims priority, application Japan, May 6, 1980, 55-59681; May 27, 1980, 55-70370
Int. Cl.³ F16J *15/12*; B32B *19/02*
U.S. Cl. 277—235 B 6 Claims

1. A gasket comprising: a sheet having a composition of 40 to 80% by weight of thin flakes of expanded vermiculite, 1 to 30% by weight of fibers, 5 to 40% by weight of fine filling grains, and appropriate amounts of a binding agent and a vulcanizing agent; and a metal plate laminated to said sheet.

4,477,095
COLLET ADAPTER

Joseph W. Atkinson, III, Horseheads, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Continuation-in-part of Ser. No. 281,098, Jul. 7, 1981, abandoned. This application Dec. 21, 1982, Ser. No. 451,776
Int. Cl.³ B23B *31/20*
U.S. Cl. 279—1 A 15 Claims



1. A device for adapting a collet to an oversized spindle on a machine tool, comprising:

(a) a generally tubular reducer bushing having an external configuration sized to fit with said oversized spindle and an internal configuration sized to receive a collet, said tubular reducer bushing having a forward end and a rearward end;

(b) said tubular reducer bushing having an annular recess projecting forwardly from said tubular bushing rearward end and said recess having forward and rearward axial ends;

(c) said forward axial end having an interior annular shoulder;

(d) said rearward axial end having interior retaining member securing means;

(e) a removable interior retaining member engaging said interior retaining member securing means and forming the rearward axial end of said annular recess;

(f) a draw tube having means for engaging a collet and being positioned at least partially within said reducer bushing,

said draw tube including a radial projection extending into said recess;

(g) removable spring means positioned in said recess between said radial projection and said removable retaining member for urging said draw tube axially forwardly in said reducer bushing; and,

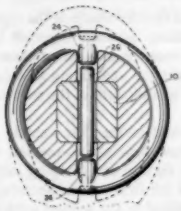
(h) means for connecting said draw tube to a collet actuating device.

4,477,096

SOCKET RETAINER

William K. Wallace, Barneveld, and David A. Giardino, Deerfield, both of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Aug. 2, 1982, Ser. No. 404,556
Int. Cl.³ B23G 3/26
U.S. Cl. 279—97 **4 Claims**



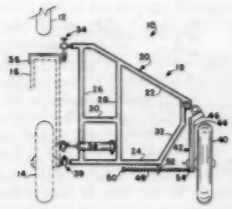
1. An elastic ring of a substantially homogenous material for use in maintaining a pin in a hole formed in a socket and a work drive shaft of a rotary tool which ring is toroidal in shape and is formed with diametrically disposed integral fingers projecting inwardly from the inner surface of the ring, said fingers being arranged to enter the ends of said hole and wherein the regions circumferentially spaced 90° from the fingers are of greater cross sectional area than any other cross sectional areas of the ring so that upon rotation of the rotary tool said fingers are driven radially inwardly.

4,477,097

NON-RIGID MOTORCYCLE SIDECAR CHASSIS WITH RIGID LOCK DEVICE

A. K. Bobo Hayes, Route 1, Box 190 W-4, Homosassa, Fla. 32646

Filed Dec. 27, 1982, Ser. No. 453,523
Int. Cl.³ B62K 27/02
U.S. Cl. 280—203 **6 Claims**



1. A motorcycle and side car assembly, comprising,

a side car frame having a swept back leading edge,

means for pivotally mounting said side car frame to a motorcycle so that said motorcycle can be tilted relative to its vertical axis of symmetry independently of said side car,

a side car wheel member disposed in laterally spaced, axial alignment with a rear wheel of a motorcycle,

said side car wheel member mounted independently of said side car frame,

said car wheel steering means to steer said side car wheel member,

said side car steering means adapted to communicate turns of a forward wheel of said motorcycle to said side car wheel so that said side car wheel turns substantially simultaneously therewith and in a direction corresponding to the direction of turn of said forward wheel,

a swing arm member to which said wheel member is rotatably mounted,

said swing arm member including a linear in configuration major portion disposed in a first position substantially parallel to the motorcycle when said motorcycle is traveling in a forward direction and disposed oblique to said first position when said motorcycle is turning,

said swing arm member including a minor portion angularly disposed to said major portion,

a forward portion of said swept back frame member leading edge pivotally secured to a frame portion of said motorcycle just rearward of a forward wheel of said motorcycle,

a rearward portion of said swept back frame member leading edge pivotally connected to said angularly disposed swing arm minor portion,

said swept back frame member leading edge being substantially linear in configuration and specifically disposed to communicate turning forces appearing at its forwardmost end just rearwardly of said forward motorcycle wheel to said swing arm member along its extent so that stresses appearing thereon as a result of said turning are distributed along said extent,

said stresses appearing on said leading edge being purely compressional or tensional for only one turn angle in each direction,

said stresses appearing on said leading edge being a vector sum of bending and compressional or tensional forces for all other turn angles,

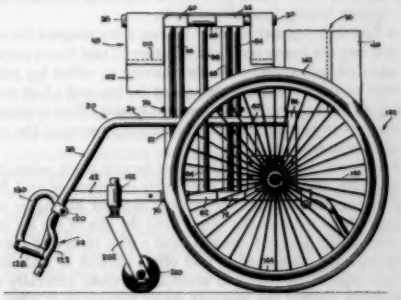
whereby the swept back design of said leading edge is subjected to reduced bending forces during turning of said motorcycle.

4,477,098

WHEELCHAIR CONSTRUCTION

Jeffrey P. Minnebraker, Westlake Village, Calif., assignor to Quadra Wheelchairs, Inc., Westlake Village, Calif.

Continuation-in-part of Ser. No. 206,346, Nov. 13, 1980, Pat. No. 4,351,540. This application May 14, 1982, Ser. No. 378,433
Int. Cl.³ A61G 5/02
U.S. Cl. 280—242 WC **34 Claims**



32. A wheelchair which is foldable and collapsable for storage and transport and which is openable for use, said wheelchair comprising:

(a) a pair of opposed first and second frame sections,

(b) a seat structure connected between said first and second frame sections and each capable of being juxtaposed relative

to one another when the wheelchair is in the folded position, said seat structure comprising:

(1) a buttocks supporting section connected between the first and second frame sections and capable of being collapsed when the wheelchair is in the folded position and expanded when in the opened position, and

(2) a back supporting section connected between the first and second frame sections and capable of being collapsed when the wheelchair is in the folded position and expanded when in the opened position,

(c) a first pair of spaced apart connecting rods with each pivotally connected to a lower portion of said first frame section at spaced apart locations between the front and rear of the wheelchair, said first pair of connecting rods also being connected to said seat structure at a pair of spaced apart points general upwardly of the second frame section,

(d) a second pair of spaced apart connecting rods pivotally connected to a lower portion of said second frame section at spaced apart locations between the front and rear of the wheelchair, said second pair of connecting rods also being connected to said seat structure at a pair of points generally upwardly of said first frame section,

(e) first pivot means for pivotally connecting one of the first connecting rods to one of the second connecting rods intermediate their upper and lower ends,

(f) second pivot means for pivotally connecting the other rod of the first pair of connecting rods to the other rod of the second pair of connecting rods intermediate their upper and lower ends, whereby said frame sections can be shifted apart to the opened position for use and shifted together to the folded position,

(g) a pair of spaced apart plates with each of said plates on an individual one of said frame sections,

(h) a plurality of axle receiving openings on each of said spaced apart plates and the pairs of openings being aligned to receive rear wheel axles,

(i) a rear wheel axle capable of extending outwardly from the rear wheel axle openings on each of said plates,

(j) a quick release means associated with said rear wheel axles to enable quick release and replacement of rear wheels on said rear wheel axles, such that said axles can be easily removed from one location and replaced in another axle receiving location on said plates so that the response and center of gravity and wheel base on said frame can be easily and quickly altered, said quick release means including a pushable element associated with said axle such that only manual pushing of said element is sufficient to cause release and ultimate removal or insertion of an axle and a rear wheel carried thereby,

(k) each of said frame sections comprising forward frame portions having lower open ends,

(l) a first foot support member having a leg adapted for insertion into the lower open end of either of said frame portions, said first foot support member having an offset leg portion with an axis offset from the axis of the leg, and a foot receiving element operatively connected to said offset portion and adapted to extend generally horizontally toward the opposite frame section, and

(m) a second foot support member having a leg adapted for insertion into the lower open ends in either of said frame portions, said second foot support member having an offset leg portion with an axis offset from the axis of the leg of the second foot support element, and a foot receiving member operatively connected to said offset portion of said second foot support member and adapted to extend generally horizontally toward the opposite frame section, said offset legs being arranged so that said foot receiving elements are located closer to said seat structure on the wheelchair and extend toward opposite sides in a first generally horizontal position when inserted into the open lower ends of the frame portions in one orientation and are located further away from said seat structure and extend toward the opposite sides in a generally horizontal position when re-oriented 180 degrees and inserted into the lower ends on the opposite frame sections.

4,477,099

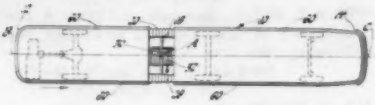
ARTICULATED COACH AIR TRANSFER SYSTEM

Robert R. Luyckx, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 15, 1982, Ser. No. 450,050

Int. Cl.³ B60D 7/02

U.S. Cl. 280—421 **2 Claims**



1. In an articulated coach vehicle of the type having first and second vehicle sections pivoted together at adjacent ends thereof for relative rotative movement about a vertical pivot axis, means for transferring ventilating air from a plenum in the first vehicle section to a plenum in the second vehicle section, comprising,

a collection manifold in the first vehicle section having a plurality of inflow passages connected to the plenum of the first vehicle section and merging into an outlet proximate the end of the first vehicle section,

a distribution manifold in the second vehicle section having an inlet proximate the end of the second vehicle section and opening to a plurality of outflow passages connected to the plenum of the second vehicle section,

and a bellows conduit connected between the inlet and outlet of the respective distribution and collection manifolds and extending normal to the vertical pivot axis, said bellows conduit being symmetrically flexible about the vertical pivot axis as the vehicle sections pivot relative to one another to provide minimum displacement of the bellows conduit.

4,477,100

FIFTH WHEEL COUPLING APPARATUS

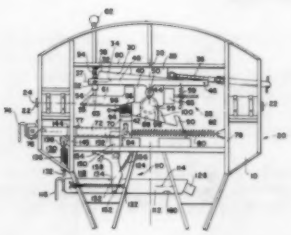
Amir Elyakim, 10/9 Hashomron St., Bat Yam, Israel

Filed Dec. 1, 1981, Ser. No. 326,341

Claims priority, application Israel, Dec. 2, 1980, 61613; Nov. 2, 1981, 64182

Int. Cl.³ B62D 53/12

U.S. Cl. 280—434 **14 Claims**



1. Fifth wheel coupling apparatus comprising:

a trailer receiving plate mountable on a vehicle chassis and defining a receiving slot for accepting a trailer pin;

a pin locking mechanism mounted onto said plate and comprising

a generally stationary portion and

a moving portion configured for sliding engagement with said trailer pin, said moving portion comprising

a first sliding element which defines an inclined surface; and

a second sliding element arranged for engagement with said inclined surface at a first location therealong during locking engagement with a trailer pin and at a second location therealong when not in locking engagement therewith; and

a second locking mechanism, said second locking mechanism being operated automatically by said first mentioned locking mechanism.

4,477,101

ARRANGEMENT FOR COUPLING AN IMPLEMENT TO A TRACTOR

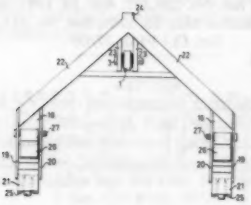
Rolf Nilsson, Eskilstuna, and Nils-Georg Lindström, Stora Sundby, both of Sweden, assignors to Tunamatic Handelsbolag, Eskilstuna, Sweden

Filed Apr. 13, 1982, Ser. No. 368,061

Claims priority, application Sweden, Apr. 15, 1981, 8102431

Int. Cl.³ B60D *7/00*

U.S. Cl. 280—461 A **5 Claims**



1. Arrangement for coupling an implement to an hydraulically operated coupling device on a tractor having a driver's seat and hydraulic lift means, said arrangement comprising

(a) a male coupling frame attached to said tractor and comprising

(i) two coupling guide beams (**22**) extending downwardly at an obtuse angle to one another to form an inverted V open at the bottom;

(ii) vertical frame members (**18**) attached to and extending downwardly from the lower ends of each of said coupling guide beams (**22**), and having catch hooks (**21**) at the lower ends thereof;

(b) a female coupling frame attached to said implement and cooperating with said male coupling frame to form a unit in coupled position, said female coupling frame comprising

(i) two substantially U-shaped coupling beams (**36**) extending downwardly at substantially the same obtuse angle to one another as said coupling guide beams (**22**) to form an inverted V open at the bottom and fitting over said coupling guide beams (**22**) of said male coupling frame in coupled position;

(ii) vertical frame members (**32**) attached to and extending downwardly from the lower ends of each of said coupling beams (**36**), the distance between said frame members (**32**) being so selected that said frame members (**32**) straddle said guide beams (**22**) of said male coupling frame in coupled position; and

(iii) a mount (**33**) provided with a coupling hook (**35**) at the lower end of each of said vertical frame members (**32**) for engagement with said catch hooks (**21**), the vertical distance from the lower edges of said coupling beams (**36**) to the lower edges of said coupling hooks (**35**) being so selected that, during the coupling operation, said coupling hooks (**35**) slide over said catch hooks (**21**), and that, in coupled position, said coupling hooks (**35**) are in firm contact with said catch hooks (**21**);

(c) a guide projection (**24**) from the top of said male coupling frame which, upon coupling of said male and female coupling frames, extends upwardly through an opening (**37**) at the upper ends of said coupling beams (**36**) to provide additional coupling engagement between said male and female coupling frames;

(d) engagement and disengagement of said male and female coupling frames being effected by actuating, from said driver's seat, said hydraulic lift means and an hydraulic operating cylinder on a top link of said coupling arrangement, the upper portion of said male coupling frame being inclined rearwardly to move said guide projection (**24**) between said coupling means (**36**), and into engagement with said opening (**37**) upon lifting of said female frame toward said male frame;

(e) power transmission from said tractor to said implement being effected between said coupling beams (**36**) and said guide beams (**22**), and between said coupling hooks (**35**) and said catch hooks (**21**).

4,477,102

CROSS COUNTRY SKI BINDING

Walter Knabel, Farchant, and Werner Messerschmidt, Garmisch-Partenkirchen, both of Fed. Rep. of Germany, assignors to Marker-Patentverwertungsgesellschaft, Baar, Switzerland

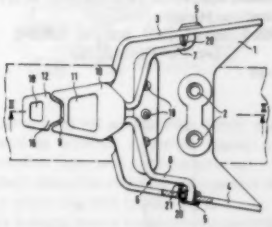
PCT No. PCT/EP81/00045, § 371 Date Jan. 7, 1982, § 102(e) Date Jan. 7, 1982, PCT Pub. No. WO81/03127, PCT Pub. Date Nov. 12, 1981

PCT Filed May 8, 1981, Ser. No. 339,435

Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017866

Int. Cl.³ A63C *9/18*

U.S. Cl. 280—615 **9 Claims**



1. A cross country ski binding comprising:

a base plate attachable to a ski, said base plate having forward and rearward end portions, and laterally spaced, upwardly extending side flanges, with generally aligned receptacles in the respective flanges;

a tensioning yoke having lateral end portions pivotally mounted in the respective receptacles, a forwardly disposed crosspiece intermediate said lateral end portions and arms extending between the respective lateral end portions and said crosspiece within the confines of said flanges, said arms being movable between a downward closed position for engaging the sole of a ski boot and an upward releasing position, and said arms being biassed outwardly towards the respective flanges;

cam means engageable by said arms for urging said arms toward the upward releasing position; and

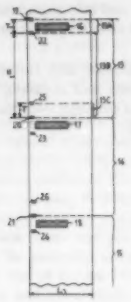
locking means for releasably engaging said crosspiece and locking said arms in the downward closed position.

4,477,103

CONTINUOUS FORM FOR PRINTER

Ugo Bertolazzi, Corsico, Italy, assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 5, 1982, Ser. No. 375,170
Claims priority, application Italy, May 7, 1981, 21537 A/81
Int. Cl.³ B42D *15/00*
U.S. Cl. 283—62 **2 Claims**



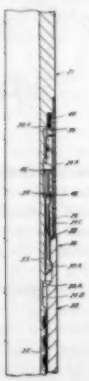
1. A continuous form for printers suitable for office automation applications, said form comprising: pre-established sheet reference marks regularly spaced along the length of said form, said marks identifying in said form a sequence of contiguous sheets, some and not all of said sheets being preprinted according to pre-established sequence criteria with a heading so that said form is constituted by a series of sheets having equal lengths, wherein first sheets with said heading follow periodically, with pre-established frequency, second sheets of a second type without said preprinted heading.

4,477,104

RELEASABLE LATCHING APPARATUS

Neil H. Akkerman, Kingwood, Tex., assignor to AVA International Corporation, Houston, Tex.

Filed Jan. 15, 1981, Ser. No. 225,395
Int. Cl.³ F16L *21/02*
U.S. Cl. 285—18 **28 Claims**



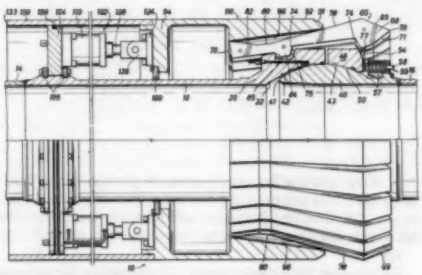
1. Apparatus for latching the end of one member to the end of another member which has a latching shoulder thereon facing away from said end, comprising a body connectible to the end of the one member and adapted to be moved into telescoping relation with respect to the end of the other member, latching means supported by the body, including a carrier and latches supported by the carrier for movement from unlatched to latched position with respect to the latching shoulder, when said body is so telescopically related with respect to the end of said other member, said body being movable in one vertical direction with respect to said latching means into a position for holding said latches in latched position, said body and latching means having means thereon for preventing movement of said body in the opposite vertical direction and out of holding position, and thus locking the body in latch holding position, and said locking means being releasable in response to rotation of the body to permit the body to be moved in said opposite vertical direction and out of latch holding position, whereby the latches are free to move into unlatched position to permit the apparatus to be moved with said one member out of telescoping relation with said other member.

4,477,105

COLLET ACTUATED BALL AND SOCKET CONNECTOR

Robert H. Wittman; David E. Adkins, and Arthur H. T. Chin, all of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 259,207, Apr. 30, 1981, abandoned.
This application May 16, 1984, Ser. No. 611,374
Int. Cl.³ F16L *27/06*
U.S. Cl. 285—18 **18 Claims**



1. A remotely operable collect actuated ball and socket connector for rigidly interconnecting the ends of two pipes, comprising:

a ball coupling member adapted for connection at one end thereof to the end of one of the pipes and having a free end thereof that terminates in a ball-shaped portion defining concentric forward and rearward facing spherical outer surface portions,

a retaining flange freely disposed about said ball coupling member and having a spherical internal surface portion for mating engagement with said rearward facing spherical outer surface portion of said ball-shaped coupling member, the rearward end portion of said flange having an inclined shoulder on the rearward edge facing outwardly from said ball coupling member,

flange retaining means mounted on said ball coupling member for maintaining said retaining flange in initial concentric and rotating mating engagement with said ball-shaped coupling member,

a socket coupling member including a cylindrical pipe extension section adapted for connection at one end thereof to the end of the other of the two pipes and having a free end thereof that terminates in a socket-shaped portion for accepting the ball-shaped coupling member in general mating engagement therewith,

a metal sealing ring disposed in an annular recess within said socket-shaped portion of said socket coupling member for sealingly mating with said forwardly facing spherical outer surface portion of said ball coupling member,

collet locking means mounted about the outer periphery of said socket coupling member and extending axially forward therefrom for permitting insertion of said ball cou-

pling member and retaining flange into mating engagement with said socket coupling member when said collet locking means is open, and engaging said inclined shoulder of said retaining flange for securing said flange and mating ball member in said socket member when said collect locking means is closed to permit a limited degree of axial misalignment between the two pipes, and

actuating means cooperating with said collet locking means for applying a predetermined axial force thereto for closing said collet locking means and multiplying said predetermined axial force applied through said collet locking means and said retaining flange into a known force applied to said rearwardly facing spherical outer surface portion of said ball coupling member for further multiplying said known force and driving said forwardly facing spherical outer surface portion of said ball coupling member into contact with said metal sealing ring to cause sealing deformation thereof against said ball coupling member, said known force applied between said retaining flange and said rearwardly facing spherical outer surface portion of said ball member also cooperating with the coefficient of friction therebetween for generating frictional forces sufficient to lock said ball coupling member rigidly into said socket coupling member for preventing relative motion therebetween.

4,477,106

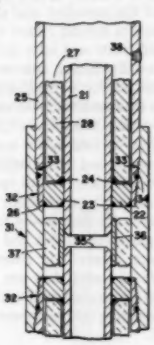
CONCENTRIC INSULATED TUBING STRING

S. O. Hutchison, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 182,364, Aug. 29, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 431,872

Int. Cl.³ F16L *59/16*

U.S. Cl. 285—47 **11 Claims**



1. In apparatus for conducting hot fluid in a subsurface earth formation through a well bore penetrating said earth formation the improvement comprising:

a concentric insulated tubing string including,

a prestressed, heat elongated inner tubing for conducting said hot fluid,

an outer tubing surrounding said inner tubing and establishing an annular volume space between the inside of said outer tubing and the outside of said inner tubing,

insulating means in said annular volume space,

substantially rigid ring like spacer means positioned along said apparatus in said annular volume space,

annular end members first secured to the outer surface of said inner tubing adjacent to the ends thereof and then secured to the inner surface of said outer tubing adjacent to the ends thereof at locations along said outer tubing where said heat elongated inner tubing aligns said end members,

threads cut into the outer surface of said outer tubing at each end thereof adjacent to the location where said end members are secured to the inner surface of said outer tubing thus forming individual sections of concentric inner and outer tubing,

coupling members having internal threads matching said threads cut into the outer surface of said outer tubing to permit said individual sections to be joined to form said apparatus,

and an annular insulating member within said coupling including deflector means engaging and enclosing adjacent ends of said inner tubings.

4,477,107

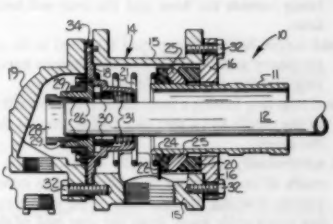
ROTATING JOINT WITH SEPARATED BEARINGS AND SEALS

George R. Ferguson, Clover, S.C., and William W. Royer, Charlotte, N.C., assignors to Duff-Norton Company, Inc., Charlotte, N.C.

Filed Nov. 27, 1981, Ser. No. 325,214

Int. Cl.³ F16L *39/04*

U.S. Cl. 285—134 **6 Claims**



1. A rotating joint for establishing supply and return fluid flow connections between stationary piping and a rotating drum and syphon pipe, said joint comprising:

hollow shaft means for coupling and rotation with said drum and for encircling said syphon pipe,

stationary housing means for enclosing one end of said shaft means and one end of said syphon pipe and comprising an elongated housing body,

shaft bearing and seal means mounted within said housing means for accommodating rotation of said shaft means relative to said housing means while sealing against fluid leakage about said shaft means,

syphon pipe bearing and seal means mounted within said housing means in spaced relation to said shaft bearing and seal means for mounting said syphon pipe for rotation relative to said housing means while sealing against fluid leakage about said syphon pipe,

shaft end flange means for closing one end of said body and for encircling said shaft means and said syphon pipe therewithin,

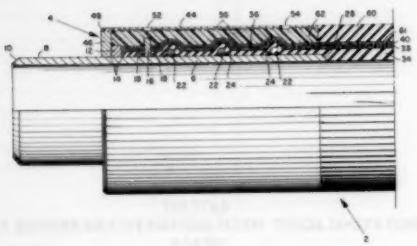
syphon end flange means disposed within said housing body for closing the other end of said body, and

said shaft bearing and seal means comprising a seal element abutting said shaft end flange means and spring means for biasing said seal means toward sealing engagement and abutting said syphon end flange means.

4,477,108
FLEXIBLE HOSE HAVING AN END CONNECTION FITTING

Leonard Castelbaum, Morrisville; Joseph M. Ostrowski, Fairless Hills, both of Pa., and Joseph H. Bedson, Jr., Lawrenceville, N.J., assignors to Goodall Rubber Company, Trenton, N.J.

Filed May 17, 1982, Ser. No. 378,840
Int. Cl.³ F16L *39/02*
U.S. Cl. 285—149 **7 Claims**



1. A flexible hose having an end connection fitting capable of withstanding high pressure and high end loads comprising:

a nipple having a front end and a rear end, the front end being outside the hose and the rear end being inside the hose,

said nipple having a stop ring attached to its radially outer periphery and a plurality of protrusions between the stop ring and the rear end of the nipple,

said stop ring having a front face facing toward the front end of the nipple and a rear face facing toward the rear end of the nipple,

a substantially tubular radially inner portion of the hose made of an elastomer overlying and in contact with the nipple, abutting the rear face of the stop ring and extending rearwardly away from the rear end of the nipple,

a plurality of lays of spirally wound reinforcing wire overlying and in contact with said inner portion of the hose and abutting the rear face of the stop ring,

said lays being part of the hose,

a sleeve having a front end flange abutting the front face of the stop ring, said sleeve overlying said nipple, spaced from the nipple and having a roughened radially inner surface,

said sleeve having a front end facing toward the front end of the nipple and a rear end facing toward the rear end of the nipple,

a substantially tubular radially outer portion of the hose made of an elastomer abutting the rear end of the sleeve and overlying the reinforcing wire outside of the sleeve, and

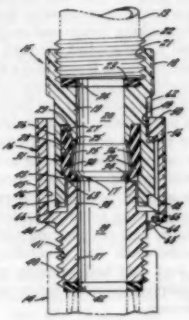
a rigid binder permeating the space between the wires and lying between and in contact with the radially inner periphery of the sleeve and the inner portion of the hose,

whereby the connection fitting is firmly attached to the hose by the inner portion of the hose engaging the nipple, by the plurality of lays of spirally wound reinforcing wire pressing toward the plurality of protrusions on the nipple, by the chemical bonds obtained between the binder and the reinforcing wire and the binder and the sleeve, by the binder surrounding at least part of the protrusions of the nipple, and by the front end flange of the sleeve abutting the front face of the stop ring.

4,477,109
CONNECTOR FOR HOSES AND THE LIKE

Guenther F. Kleuver, Rockford, Ill., assignor to GFK Partnership, Rockford, Ill.

Filed Jul. 29, 1981, Ser. No. 288,129
Int. Cl.³ F16L *17/00, 47/00, 21/00, 37/00*
U.S. Cl. 285—361 **11 Claims**



1. A connector for hoses and the like having, in combination, a first tubular member having an inlet end portion and a first sealing end portion, a second tubular member having an outlet end portion and a second sealing end portion opposing said first sealing end portion, one of said members having a cylindrical skirt encircling and projecting axially beyond the sealing end portion of that member and the other of said members having a cylindrical sleeve encircling and extending beyond the sealing end portion of that member, said sleeve telescoping with said skirt, said members having alined axial passages for the flow of pressure fluid from said inlet end portion to said outlet end portion, an axially facing annular sealing surface formed on the sealing end portion of said second member and encircling the passage in that member, said surface facing said inlet end portion of said first member, a cylindrical sealing element of resilient material carried by the sealing end portion of said first member and encircling the passage in that member, an annular lip formed on said element and opposing said sealing surface around the entire circumference thereof, said lip being inclined radially inwardly and axially toward said annular sealing surface to engage and to flex and at least partially flatten against the surface around the entire circumference thereof when said sleeve and said skirt are telescoped, said pressure fluid urging said lip against said sealing surface, and means for releasably connecting said members with said sleeve and said skirt telescoped.

4,477,110
DOOR HANDLE CLIP

Norman L. Smith, Nepean, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

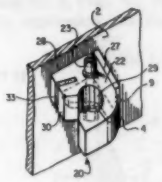
Filed Jan. 21, 1983, Ser. No. 459,963
Claims priority, application Canada, May 27, 1982, 403862
Int. Cl.³ E05C *21/02*
U.S. Cl. 292—1 **3 Claims**

1. A door handle clip for holding a generally circular cross-sectional door operating lever of the type used to open a ship's bulkhead door, said clip comprising a plastic body for mounting on a bracket regularly associated with a door frame of the bulkhead door, said body including one end adapted for abutment against the door frame and the mounting bracket and another end for extension beyond the mounting bracket to thereby expose one side of said body to a path of operation of the door lever, said body further including:

means defining a recess in said one side of said body for receiving and retaining a portion of the lever, said recess

defining means having (a) a substantially circular inner aperture disposed near said other end and sized to accept said door lever portion therein and (b) an inwardly tapered entrance in communication with said inner aperture, said entrance having an outer end dimension greater than the diameter of said inner aperture and an inner end dimension, adjacent said inner aperture, less than the diameter of said inner aperture; and

means defining a groove in said one side of the body and disposed near said one end intermediate said recess defining means and said one end of said body, said groove



extending substantially parallel to said inner aperture to establish a flexion arm which is flexibly displaceable between normal and displaced positions, said groove defining means for permitting flexion of said flexion arm to said displaced position to responsively increase said inner end dimension to permit said operating lever to be received by said inner aperture by virtue of said increased inner end dimension, and wherein upon said operating lever being received in said inner aperture, said flexion arm is flexibly displaced to said normal position to reestablish said inner end dimension and to thereby removably retain said operating lever in said inner recess.

4,477,111

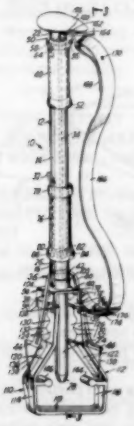
PET WASTE PICKUP DEVICE

Sidney R. Crooks, 385 Hawthorne St., Brooklyn, N.Y. 11225

Filed Nov. 12, 1981, Ser. No. 320,200

Int. Cl.³ A01K *29/00*

U.S. Cl. 294—1 BA **20 Claims**



1. A pet waste pickup device comprising:

an elongated tubular member;

a pair of jaws pivotally connected to a bottom portion of said tubular member;

actuator means on said tubular member for pivotally opening and closing said jaws to thereby open and close a mouth of an inverted disposable waste bag positioned thereon;

plunger means on said tubular member for releasably retaining the inverted disposable bag, said plunger means being axially movable between an extended position wherein the bag is positioned folded about the jaws and a retracted position wherein the bag is extracted from about the jaws with its mouth being sealed;

release means coupled to said plunger means for releasing the sealed bag from said plunger means; and

said actuator means including a rod slidably disposed within said tubular member and terminating at its lower end in a pair of arms extending below said tubular member, a scissor-like mechanism interconnecting each arm with a respective opposing side of said pair of jaws, a sleeve slidably mounted on said tubular member, and coupling means for coupling said sleeve to said rod, whereby axially sliding of said sleeve upwardly and downwardly with respect to said tubular member causes said scissor-like mechanism to operate so as to respectively close and open said jaws.

4,477,112

SEMICONDUCTOR SUBSTRATE HANDLING TRAY

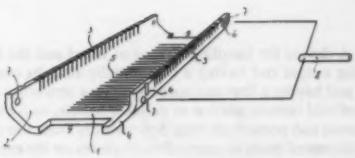
Karl A. Schülke, Neuberg, Fed. Rep. of Germany, assignor to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Continuation of Ser. No. 246,132, Feb. 23, 1981, abandoned. This application Apr. 18, 1983, Ser. No. 486,152

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024751

Int. Cl.³ B65D *25/28*

U.S. Cl. 294—16 **5 Claims**



1. A semi-conductor substrate handling tray to receive and hold disk or plate-like semi-conductor substrates comprising

a generally trough-like elongated element of quartz glass which is open at the top and at the ends, and having a bottom wall (1) and side walls (2),

said side walls having upper portions extending at right angles with respect to the bottom wall and essentially straight inclined connecting portions (4) extending at an angle of approximately 45° from the bottom wall (1) to the upper portions and smoothly angularly merging with the bottom wall and the upper portions, free from sharp corners;

slots (5) cut into the bottom wall which extend to a depth of about half the thickness of the bottom wall,

and slits (3) cut into the upper portions of the side walls, said slits extending from the upper edge of the upper portions of the side walls up to about one quarter of the distance between the upper edge of the side walls and the bottom surface of the bottom wall and terminating above the inclined connecting portions,

said slots and slits being located at intermediate—with respect to the longitudinal extent of the tray—portions thereof to receive the disk or plate-like substrates therein in stacked alignment and to provide for three-point retention of the substrates in the bottom slot and opposite sides in said slits in the upper portions of the side walls (2) and the essentially straight inclined connection portions (4) leaving space between the walls of the connecting portion and the edges of the disk, or plate-like semiconductor

substrates for longitudinal passage of treatmentgas to which the substrates are to be exposed;

alignment notches or grooves (6) formed in the solid end portions of the side walls (2) extending in a direction transverse to the plane of the bottom wall (1);

transverse holes (7) formed in the solid end portions of the side walls and extending, in transverse alignment, through the thicknesses of the side walls to receive a holding or carrier fork (8) having projecting tines spaced from each other by the distance of the holes (7) in the respective end portions of the side walls, and for lifting and supporting the carrier, while leaving the region of the carrier in which said slits (3) and said slots (5) are formed free and unobstructed.

4,477,113

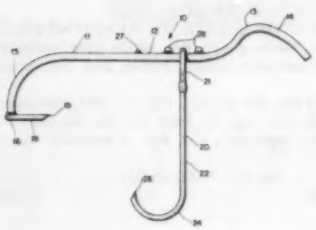
WOOD HANDLING TOOL

Arden F. Lybolt, Rte. 2, Tunkhannock, Pa. 18657

Filed Jun. 14, 1983, Ser. No. 504,372

Int. Cl.³ B65G *7/12*

U.S. Cl. 294—16 **7 Claims**



1. A device for handling a piece of wood and the like comprising a rigid rod having a substantially straight central portion and having a first end portion curving upwardly from one end of said central portion to define a handle, said rod having a second end portion curving downwardly from the other end of said central portion, pointed tooth means on the extreme end of said rod second end portion and directed toward the central portion of said rod, a gripping member having a loop at one end thereof loosely encircling said rod central portion to depend freely therefrom, said gripping member having a pair of legs diverging downwardly from said loop, a pointed tooth on the end of each of said legs directed substantially towards said pointed tooth means, said pointed teeth and tooth means being sufficiently sharp to penetrate into a piece of wood and thereby exert a gripping action on a piece of wood positioned between said tooth means and said gripping member when a lifting force is exerted on said handle, means on said rod central portion for positioning the loop of said gripping member thereon, said positioning means comprises a transverse rod element attached to the upper surface of said rod central portion and a plurality of projections spaced therefrom toward said handle.

4,477,114

ADJUSTABLE RAKE HEAD AND IMPROVED HANDLE SUPPORT

Howard F. Callis, Box 715, Mathews, Va. 23109

Filed May 12, 1983, Ser. No. 493,829

Int. Cl.³ A01B *1/20*

U.S. Cl. 294—50.6 **2 Claims**

1. A system for gathering and removing debris from a ground surface comprising in combination:

first and second rake means each comprised of an elongate handle,

a rake head,

a plurality of tines having inner end portion secured to said rake head and free end portions extending generally in one direction away from said rake head,

means for attaching the rake head to one end of the handle, and strap means comprised of a closed loop for engaging around the forearm of a user, said strap means being attached to said handle adjacent the other end thereof,

said system being characterized in that said rake means are free of and unattached to and freely moveable with respect to one another,

the means for attaching the rake head to said one end of said handle comprising pivot means connecting said handle and rake head for rotational adjustment about an axis disposed transversely to the lengths of said handle and rake head.

4,477,115

REAR WINDOW STRUCTURE FOR AN AUTOMOTIVE VEHICLE AND A WEATHERSTRIP WITH A SPOILER FIN THEREFOR

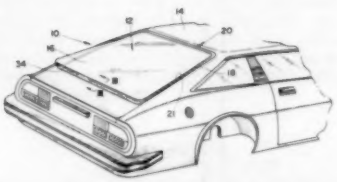
Noboru Asakura, Yokohama; Motoo Yanagawa, Zushi, and Takatoshi Tsugahara, Kawasaki, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Feb. 8, 1982, Ser. No. 346,633

Claims priority, application Japan, Feb. 9, 1981, 56-17890

Int. Cl.³ B62D *37/02*

U.S. Cl. 296—1 S **12 Claims**



1. An automotive vehicle having an improved rear window structure, comprising:

a vehicle body having inner and outer panels with edges joined to establish a rear opening;

a transparent window positioned within said rear opening; and

a weatherstrip having a main portion engaging both an edge of said rear opening and circumferentially engaging an edge of said window, said main portion being integrally formed with a rear spoiler fin section protruding therefrom to reduce a drag coefficient of the vehicle, said fin section extending rearwardly along at least one circumferential edge of the window, said main portion extending continuously between the fin section and outer panel in sealing contact with the joined edges of the panels and in substantially continuous sealing contact with an outer

surface of the outer panel adjacent the joined edges, said main portion between the fin and outer panel thereby establishing a continuous mass to support the fin on the outer panel.

4,477,116

SUN VISOR FOR AUTOMOTIVE VEHICLES WITH MOLDING FOR VISOR BODY COVERING

Lothar Viertel, Saarlouis, and Gert Mahler, Radevormwald, both of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Jul. 8, 1982, Ser. No. 396,405

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3128853

Int. Cl.³ B60J *3/02*

U.S. Cl. 296—97 H **21 Claims**

1. A sun visor for a motor vehicle, or the like, comprising:

a relatively flat core having a first side facing a first direction, a second side facing a second direction generally opposite the first direction, and a peripheral around the first and second sides; the core having a peripheral molding extending around the periphery around the first and second sides; the peripheral molding having opposite outwardly facing first and second side surfaces facing generally in the first and second directions, respectively and an exposed outer edge joining the first and second side surfaces;

covering material extending over the first and second sides of the core and having first and second peripheral edge regions for extending to and being secured to the opposite first and second side surfaces, respectively, of the peripheral molding, thereby covering over the core up to the peripheral molding without covering the exposed outer edge of the peripheral molding.

4,477,117

WHEEL CHAIRS

Arthur B. Higgs, 32 Whistler Ave., Unley Park, South Australia, Australia

PCT No. PCT/AU80/00095, § 371 Date Jul. 22, 1981, § 102(e) Date Jul. 22, 1981, PCT Pub. No. WO81/01365, PCT Pub. Date May 28, 1981

PCT Filed Nov. 21, 1980, Ser. No. 287,733

Claims priority, application Australia, Nov. 22, 1979, PE01447

Int. Cl.³ A47C *4/28*

U.S. Cl. 297—45 **3 Claims**

1. A folding wheel chair comprising:

a pair of spaced parallel main frames each carrying a real wheel and a forward wheel;

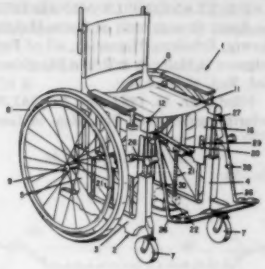
a seat and back rest frame vertically slidable relative to the main frames;

a flexible seat and back rest carried by said seat and back rest frame;

a side frame between each of said main frames and said seat and back rest frame, each said side being vertically slidably mounted on guides on each respective main frame;

cross strut stabilizing means interconnecting a lower portion of each of the side frames to the seat and back rest frame;

elevating means connected between said side frames and said main frames to raise said side frames relative to said main frames to thus raise said seat and back rest portion relative to said main frames while maintaining said frames in



spaced parallel relationship, whereupon on folding the said chair said seat and back rest frame rises relative to the side frames through cooperating movement of said cross strut stabilizing means.

4,477,118

RECLINING AND ROCKING OFFICE CHAIR

Harold P. Ruble, Deerfield, Mich., assignor to La-Z-Boy Chair Co., Monroe, Mich.

Filed Mar. 5, 1982, Ser. No. 355,204

Int. Cl.³ A47C *1/02*

U.S. Cl. 297—85 **10 Claims**

1. An office chair comprising a mobile pedestal-type carriage including a vertical column and a horizontal span beam mounted on top of said column, a chair frame, said chair frame including a transverse front rail member, said front rail member being formed of metal and of an arch-shaped configuration with a top horizontal web section and with substantially vertical left and right hand downwardly extending side legs, pivot means between the chair frame and said span beam to provide for rocking movement of said frame about a fixed horizontal axis, a seat frame, links attached at their upper ends to the seat frame and at their lower ends to the respective left and right hand side legs of said front rail member to movably support the front of said seat frame on said rail member, a leg rest frame, pantograph linkage mechanism secured to and carrying the load of said leg rest and operable to move said leg rest frame between an extended substantially horizontal position and a retracted substantially vertical position adjacent to said front rail member, said pantograph linkage mechanism being supported on said front rail member, operating means for said pantograph linkage mechanism including a horizontal rotary drive shaft journaled at opposite ends on said chair frame and further including a spring biased toggle mechanism driven by said drive shaft and resiliently connected at a rear end portion to said span beam.

4,477,119

PLANING MACHINE FOR UNDERGROUND MINING WITH A CUTTER IN THE TRANSITION RANGE FROM LONGWALL TO DRIFT, PARTICULARLY FOR A SIMULTANEOUSLY MINED DRIFT

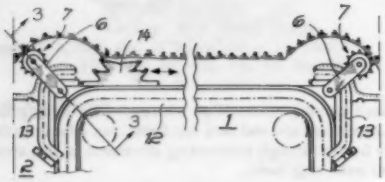
Gert Braun; Ernst Braun, both of Essen-Heisingen, and Walthorst Herwig, Erkelenz/Hetzerath, all of Fed. Rep. of Germany, assignors to Halbach & Braun Maschinenfabrik GmbH & Co., Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,381

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113720

Int. Cl.³ E21C *27/34*

U.S. Cl. 299—34 13 Claims



1. In a mining apparatus comprising a planing device which is movable along a longwall to a drift and has a longwall conveyor extending alongside the longwall deflected into the drift for the removal of cut away material, the improvement comprising a cutter operable in a transition area between the longwall and drift including a first bearing shaft rotatably mounted to the longwall conveyor in the transition area, a swivel arm having an inner end pivotal to said first bearing shaft and swingable in a cutting zone between the drift and the longwall, a second bearing shaft rotatably mounted to said swivel arm and at an outer end thereof, at least one rotatable cutting roll connected to said second bearing shaft and rotatable therewith at said swivel arm outer end for cutting away material in the cutting zone, a cutting roll chain engaged between said first bearing shaft and second bearing shaft to rotate said cutting roll to cut away material in the cutting zone, a plane chain movably mounted with respect to the longwall conveyor and connected to the planing device for moving the planing device along longwall, and a guide roller connected to said first bearing shaft for rotation therewith, said plane chain engaged on said guide roller for rotating said guide roller to rotate said first bearing shaft.

4,477,120

CROWN BRAKE WITH CROWN FASTENED TO THE WHEEL

Jacques Jamon, Cébazat, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Jan. 3, 1983, Ser. No. 455,303

Claims priority, application France, Jan. 18, 1982, 82 00940

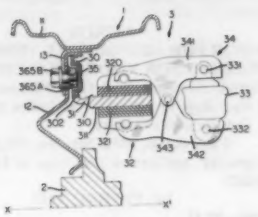
Int. Cl.³ F16D *55/12*

U.S. Cl. 301—6 W 3 Claims

1. A crown brake comprising a crown and at least one jaw having two linings, one arranged radially outwards and the other radially inwards of the crown, the jaw being rigidly connected to a vehicle and the crown being rigidly connected to a wheel and coaxial to it, the wheel having a rim and a wheel disk, characterized

by the fact that the crown is connected to the wheel disk by means of n connecting pieces (n being equal to or greater than 3) arranged at the periphery of the crown and spaced from each other by an angle of $2\pi/n$ radian referred to the axis of rotation of the assembly formed by the wheel and the crown; and

by the fact that each of the connecting pieces comprises at least one flexible element arranged between, on the one hand, means for attaching this element to the wheel disk and, on the other hand, means for attaching this element to the brake crown and formed of a portion which is flexible in the radial direction of the wheel and of portion which



is flexible in the axial direction of the wheel, the radially flexible portion being adjacent to the axially flexible portion.

4,477,121

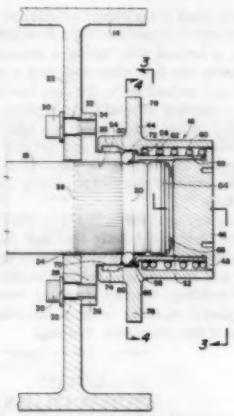
QUICK RELEASE WHEEL

Michael T. Atkins, 1820 S. 132nd E. Pl., Tulsa, Okla. 74108

Filed Sep. 30, 1982, Ser. No. 429,314

Int. Cl.³ B60B *27/02*

U.S. Cl. 301—112 4 Claims



1. A quick release coupling for a wheel and axle comprising an axle having an outer end for receiving a wheel thereon, said axle having a circumferential ball receiving groove adjacent to said end, a wheel having a hub with a central opening therein for receiving said end of said axle, a bushing mounted on the hub surrounding said central opening for receiving the end of said axle, means for preventing relative rotational movement of said wheel and said axle when said axle is received in said bushing, said bushing having a plurality of ball receiving holes therein arranged in spaced circumferential relation thereabout for overlying said ball receiving groove when said axle is in a locked position relative to said wheel, a plurality of balls received in said ball receiving holes, a locking sleeve slidably and axially mounted on said bushing, a first spring means for urging said sleeve towards said wheel, a plunger centrally mounted within said bushing, a second spring means for urging said plunger against said end of said axle, a stop means for limiting the axial movement of said sleeve towards said wheel, said sleeve having an internal cylindrical surface overlying said balls in said locked position to hold said balls in said ball receiving groove, said sleeve being provided with an internal ball

receiving recess of larger diameter than that of said internal cylindrical surface and located inwardly thereof towards said wheel, and handle means on said sleeve for manually pulling said sleeve axially away from said wheel to permit said balls to drop into said ball receiving recess thereby permitting withdrawal of said wheel from said axle, said plunger, after said wheel has been withdrawn from said axle, moving towards said balls and retaining said balls in said ball receiving recess.

4,477,122

HYDRAULIC PRESSURE CONTROL VALVE FOR AUTOMOBILE BRAKING SYSTEM

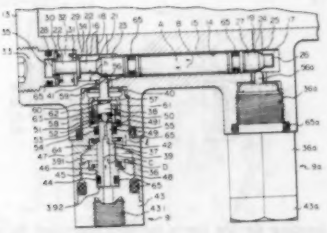
Yoshihiro Hayashida, Kanagawa, Japan, assignor to Tokico Ltd., Japan

Filed Mar. 17, 1983, Ser. No. 476,393

Claims priority, application Japan, Mar. 19, 1982, 57-39192[U]

Int. Cl.³ B60T 8/26

U.S. Cl. 303—6 C **4 Claims**



1. A hydraulic pressure control valve for use in a hydraulic braking system having two independent pressure circuits in an automotive vehicle, said valve comprising a housing having an axially extending bore with the opposite end portions thereof being communicated with respective pressure circuits, a plunger slidably received in the bore and having on opposite end portions inclined surface portions formed between large diameter portions and small diameter portions respectively, and two pressure proportioning valve mechanisms communicated respectively with opposite end portions of said bore, each of said valve mechanisms being mounted on the housing with the axis thereof being perpendicular to the axis of the bore,

each valve mechanism including a differential pressure piston, an axial passage formed in the piston with the end of the passage nearer the end portion of said bore being formed to define a valve seat and the other end of said passage remote from said end portion of the bore being adapted to be connected to a brake cylinder of a rear wheel of said vehicle, a valve member cooperating with said valve seat in response to the displacement of said piston, and a control member disposed between the valve member and the plunger, said control member abutting normally with the large diameter portion thereof and being connected to said valve member such that when the control member abuts with the small diameter portion of said plunger in response to the axial displacement thereof said control member carries the valve member in the direction separating from the piston thereby preventing pressure proportioning function of said valve mechanism.

4,477,123

HYDRAULIC BRAKE SYSTEM FOR VEHICLES

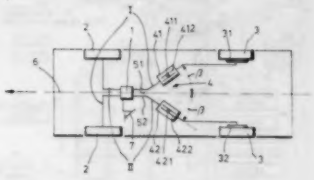
Otmar Schnürer, Gifhorn, Fed. Rep. of Germany, assignor to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 423,048

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1982, 3201255

Int. Cl.³ B60T 8/24, 8/26

U.S. Cl. 303—24 R **2 Claims**



1. A hydraulic brake system for a vehicle having a longitudinal axis and including first and second rear wheels situated at opposite sides of said axis, comprising

(a) first and second rear wheel brakes mounted in said first and second rear wheels, respectively;

(b) first and second brake lines communicating with said first and second rear wheel brakes, respectively, for supplying hydraulic fluid under pressure thereto; and

(c) first and second valves in said first and second brake lines, respectively; said valves together forming a mass inertia actuated, deceleration and transverse acceleration controlled braking force distributing device, each said valve including

(1) a movable valve member controlling, as a function of its position, the flow of hydraulic liquid through the brake line with which the movable valve member is associated; each movable valve member being displaceable by deceleration and acceleration forces imparted thereto as a function of the motion behavior of the vehicle; and

(2) a guide track guiding the associated movable valve member with a single degree of freedom of motion; each guide track sloping downwardly towards the vehicle rear at an angle α with respect to a horizontal plane; each guide track inclining away from said axis outwardly towards the vehicle rear in the direction of the associated rear wheel brake at an angle β which a vertical projection of each guide track onto a horizontal plane defines with said axis.

4,477,124

SPEED-RESPONSIVE RETARDER CONTROL SYSTEM PROVIDING FOR OVERHEAT PREVENTION

Masahiro Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 21, 1981, Ser. No. 332,735

Claims priority, application Japan, Dec. 27, 1980, 55-185053

Int. Cl.³ B60T 8/02

U.S. Cl. 303—100 **9 Claims**

1. In a motor vehicle equipped with a fluid-actuated retarder, a control system comprising:

(a) speed control means for actuation by a vehicle operator;

(b) a speed setter responsive to the actuation of the speed control means for putting out a speed setting signal representative of a desired speed of the vehicle;

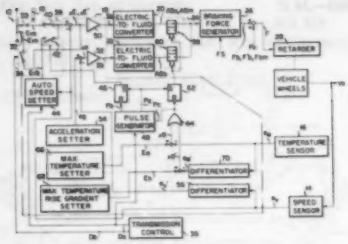
(c) a speed sensor for putting out an actual speed signal representative of the actual traveling speed of the vehicle;

(d) a temperature sensor for putting out a temperature signal representative of the temperature of a retarder fluid;

(e) a control circuit connected to input the speed setting signal from the speed setter, the actual speed signal from the speed sensor, and the temperature signal from the

temperature sensor, the control circuit putting out a first braking signal, corresponding to the difference between the speed setting signal and the actual speed signal, and a second braking signal of smaller magnitude than the first braking signal;

(f) selector means under the control of the control circuit for normally permitting the passage therethrough of the first



braking signal from the control circuit and, in the event of a prescribed change in the temperature of the retarder fluid as represented by the temperature signal, the second braking signal from the control circuit; and

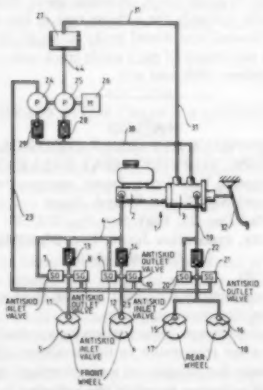
(g) a braking force generator responsive to the first or second braking signal from the selector means for proportionately generating a braking force for actuation of the retarder.

4,477,125

HYDRAULIC BRAKE SYSTEM HAVING AN ANTISKID SYSTEM

Juan Belart, Walldorf; Dieter Kircher; Ludwig Büdecker, both of Frankfurt am Main, and Georg Obersteiner, Ffm-Sossenheim, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 205,549, Nov. 10, 1980, abandoned.
This application Sep. 17, 1982, Ser. No. 419,685
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952221
Int. Cl.³ B60T *8/02, 13/14*
U.S. Cl. 303—116 **16 Claims**



1. A hydraulic brake system for a motor vehicle comprising:

an unpressurized pressure fluid reservoir;

at least one wheel brake cylinder;

an antiskid control valve arrangement having a normally open inlet valve with its outlet coupled to said wheel brake cylinder and a normally closed outlet valve with its inlet coupled to said wheel brake cylinder, said inlet valve being closed and and said outlet valve being opened during an antiskid control cycle; and

a pressure fluid source coupled to said reservoir and said valve arrangement including

a brake pedal controlled wheel brake cylinder actuator having a pressure fluid outlet coupled to an inlet of said inlet valve, and

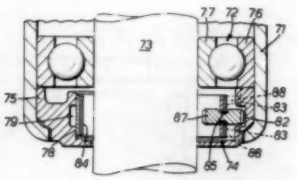
two pumps having a common mechanical drive means, a first of said two pumps having a suction connection coupled to said reservoir and a pressure fluid outlet coupled to a pressure fluid inlet of said brake pedal controlled actuator and a second of said two pumps having a suction connection coupled to an outlet of said outlet valve independent of said reservoir and a pressure fluid outlet coupled to said pressure fluid inlet of said brake pedal controlled actuator.

4,477,126

LOCKING DEVICES

Derek T. Price, Worcester, England, assignor to Dowty Meco Limited, England

Filed Feb. 16, 1982, Ser. No. 348,783
Claims priority, application United Kingdom, Feb. 26, 1981, 8106116
Int. Cl.³ F16C *13/00, 19/52*
U.S. Cl. 308—1 A **10 Claims**



1. A locking device for a member mounted by way of a bearing on a shaft, which member and shaft are relatively-rotatable, said locking device including a locking element, which in its operative position is engageable with at least one of said member and said shaft, and further including a heat-sensitive member which normally holds the locking element out of its operative position and which is disosed close to said bearing with part at least of said heat-sensitive member lying exteriorly of the shaft between said relatively-rotatable member and shaft, means including an inclined surface on one of said member and said shaft so that movement of the locking device into its operative condition to lock said member or shaft, whichever is rotating, occurs gradually, said locking element including a roller which is mechanically engageable with both said member and said shaft to effect locking.

4,477,127

TAPE PLAYER FOR VEHICLES

Masato Kume, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1982, Ser. No. 418,819
Claims priority, application Japan, Sep. 21, 1981, 56-149005
Int. Cl.³ B62J *9/00*
U.S. Cl. 312—8 **9 Claims**

1. A tape player for vehicles which comprises:

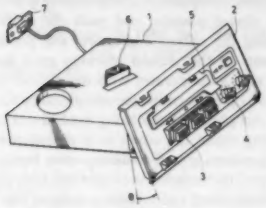
a tape player set contained in a casing;

an operation board provided on the front face of said tape player set casing;

cushion members secured on the top and the bottom surfaces of said tape player set, respectively;

an inner case for covering said tape player set and its casing; and

an outer case receiving therein said tape player set and its casing and said inner case,



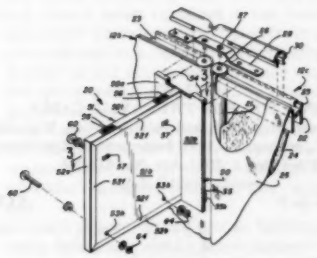
said cushion members being fixed directly to said outer case in a manner permitting disassembly thereof and said inner case being fixed to said tape player set in a manner permitting disassembly thereof.

4,477,128

PARTITION SYSTEM STORAGE UNIT SUPPORTS

Gene B. Hasbrouck, Corry, Pa., assignor to Hon Industries Inc., Muscatine, Iowa

Filed Dec. 11, 1981, Ser. No. 329,806
Int. Cl.³ A47B *87/00*; F16B *12/00*
U.S. Cl. 312—111 **17 Claims**



1. An intermediate support member for disposition between two storage units arranged in end-to-end alignment with one another when suspended on a vertical panel partition, means for suspending said support member on such a partition, and means for attaching the respective adjacent ends of such storage units to said intermediate support member and including adjustable take-up tension means for transferring tensile forces between the lower portions of such storage units to form an integral rigid unit of said storage units and said intermediate support member when suspended on such a partition.

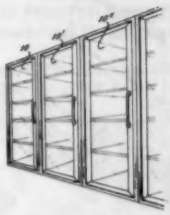
4,477,129

DISPLAY TYPE REFRIGERATOR/FREEZER CABINET

James J. Heaney, Glendale, Calif., assignor to Anthony's Manufacturing Company, Inc., San Fernando, Calif.

Division of Ser. No. 187,558, Sep. 15, 1980, Pat. No. 4,382,177.
This application Jun. 18, 1982, Ser. No. 389,675
Int. Cl.³ E06B *3/38, 3/40*; A47F *3/04*
U.S. Cl. 312—116 **5 Claims**

1. In a display type refrigerated cabinet having a transparent viewing area comprising a cabinet body for installation inside a building and for containing merchandise required to be kept at least colder than the ambient temperature in the region surrounding the cabinet, apparatus for maintaining the temperature in the region inside the cabinet at least colder than the ambient temperature region surrounding the cabinet and including transparent pane structure for viewing the contents inside the cabinet, the improvement wherein at least some of the transparent pane structure is a single pane having one surface directly exposed in use to the warmer ambient region outside the cabinet, and an opposed surface in use facing the colder region inside the cabinet, and having an infrared reflecting visible light transmitting coating applied to the surface facing the colder region for reflecting a substantial portion of infrared radiation incident on said coating from the warmer region, so as to restrict substantial transmission of infrared



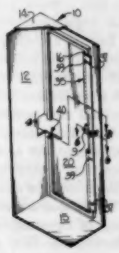
radiation from the warmer region to the colder region and so as to heat the surface of the pane exposed in use to the warmer region sufficiently to prevent formation of a visibility-impeding layer thereon by reradiation of the reflected infrared radiation back through the pane toward the warm region and for transmitting a substantial portion of visible light radiation incident on said coating, to enable substantially clear visibility therethrough.

4,477,130

SECURITY CABINET FOR STORAGE OF VALUABLES

James S. Frantz, Roanoke, Va., assignor to Tread Corporation, Roanoke, Va.

Filed Feb. 10, 1983, Ser. No. 465,555
Int. Cl.³ E05B *65/06*
U.S. Cl. 312—219 **6 Claims**

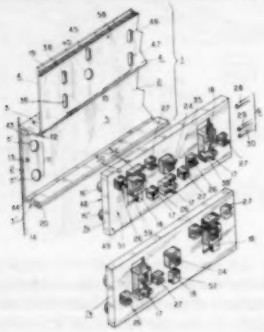


1. In a cabinet of metal construction and adapted for being used to protect one's valuables, said cabinet having a hinged door with a flange positioned along the inner side of the door and extending generally parallel to the face of the door and toward the hinged side of the door, the combination therewith of locking means carried by the cabinet on the side opposite from the hinged side of the door and cooperating with said door flange to maintain the cabinet door in locked closed position, said locking means comprising door flange obstructing means carried on the inside of the cabinet adjacent the door flange for contacting the outermost surface of said door flange so as to prevent outward movement of the door to the open position, and means operably connected to said door flange obstructing means for moving the same to the locked and unlocked positions with respect to the door flange.

4,477,131
ELECTRIC DISTRIBUTION BOARD

Jean Joly, Houilles, France, assignor to La Telemecanique Electrique, France

Filed May 20, 1980, Ser. No. 152,065
Claims priority, application France, May 21, 1979, 79 13713
Int. Cl.³ H01R *4/66, 13/506*
U.S. Cl. 339—14 R **8 Claims**

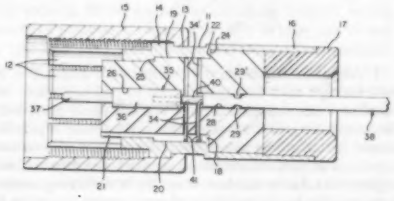


1. An electrical distribution device, comprising a surface mounting raceway having a back member adapted to be mounted on a wall and a front cover, said raceway being intended to accomodate electrical conductors, longitudinally arranged within the said raceway and each having a core and an insulating sheath, said conductors including two phase conductors and an earthing conductor, a plurality of conductor positioning and retaining units, lodged within the said raceway at predetermined positions along the length of said raceway and a plurality of current feed plugs having conductive pins adapted to pass through the conductor sheaths and to enter into contact with the conductor cores, said plugs being of a first type having a first arrangement of the said conductive pins which is adapted for feeding an electrical apparatus having an earth connection and of a second type having a second arrangement of the said conductive pins, which is adapted for feeding an electrical apparatus without any earth connection, said back member having a U-shaped cross-section with a flat back surface portion and first and second wing portions respectively having a free longitudinal edge and a connecting longitudinal end portion, a permanent hinge being formed at the said connecting longitudinal end portion for pivotally connecting the said cover to the said second wing portion of the back member, locking means at the said free edge for locking the cover in closed position, a first plurality of openings being formed in the said back surface and a second plurality of openings being formed in the said cover, the second plurality comprising a first group of openings arranged for receiving the conductive pins having the first arrangement and a second group of openings arranged for receiving the conductive pins having the second arrangement, the openings of the said first and second pluralities respectively having predetermined relative positions obtained by simultaneous punching of the said back surface and of the said cover to provide cut out portions and the openings of the second plurality being closed by said cut out portions of the cover which have been put back into the respective openings, each of said conductor positioning and retaining units comprising a support member having a flat back surface and a front surface, said flat back surface engaging the said flat back surface portion of the raceway and having centering projections which engage into the openings of the said first plurality, first and second pluralities of selector means being mounted on the said first face of each of the said conductor positioning and retaining units, said selector means being located along first, second and third generally parallel lines along which the two phase conductors and the earthing conductor are respectively positioned, the said selector means respectively facing openings of the said second plurality of openings when said cover is in closed position, the selector means of the first plurality each having projecting parts which pass through respective openings of the second plurality when the cover is in closed position and push out from the said respective opening the corresponding cut out portion, while the selector means of the second plurality each have a flat surface portion which cooperates with the cut out portion of the said respective opening of the second plurality for preventing the said cut out portion from being pushed out of the said respective opening when the cover is in closed position, the said conductor positioning and retaining units being of a first and a second types, the selector means of the first plurality of the conductor positioning and retaining units of the first type being positioned facing openings of the said first group and the selector means of the second plurality of the conductor positioning and retaining units of the first type being positioned facing openings of the said second group, while the selector means of the first plurality of the conductor positioning and retaining units of the second type are positioned facing the openings of the said second group and the selector means of the second plurality of the conductor positioning and retaining units of the second type are positioned facing the openings of the said first group.

4,477,132
CONNECTOR FOR TWIN AXIAL CABLE

Jessie L. Moser, Highpoint, and John D. West, Walkertown, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 6, 1982, Ser. No. 433,064
Int. Cl.³ H01R *4/66*
U.S. Cl. 339—14 P **5 Claims**

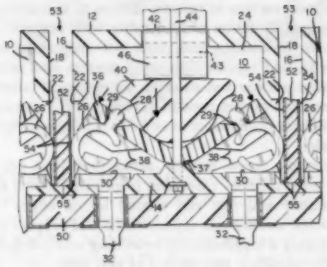


1. An electrical connector for terminating flat multiconductor shielded cable having a drain wire and comprising a metal sleeve having spring contact fingers extending from a forward mating end, a locking cap rotatably mounted on the sleeve to extend from the mating end surrounding the spring contact fingers, a generally cylindrical, insulating, terminal-locating block receivable as a close fit within the sleeve to locate terminals projecting from the mating end within and isolated from the spring contact fingers and a retention bush attachable to the rear end of the sleeve to retain the terminal-locating block in the sleeve, the block being bipartite, each part being generally hemicylindrical and being formed with terminal-receiving recesses at a mating end communicating with a cable-receiving recess at a rear end across which extends a cable-clamping means, a drain wire-receiving passageway extending radially through each part in communication with the cable receiving recess, whereby the drain wire may be terminated to the metal sleeve.

4,477,133
MINIATURE CAM DRIVEN CONNECTOR FOR A CIRCUIT BOARD EDGE

Nicola Cosmo, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 23, 1982, Ser. No. 410,291
Int. Cl.³ H01R 9/09
U.S. Cl. 339—17 M 18 Claims

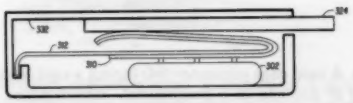


1. A circuit board edge connector, comprising:
an insulative housing;
conductive post projecting from said housing;
circuit board having circuit conductors contained thereon, said circuit board being received by said housing;
spring contact means contained in said housing and being electrically conductive and adapted for providing electrical communication between corresponding circuit conductors on said circuit board and said conductive posts, said spring contact means pivotally attached to a contact holder means;
contact holder means contained in said housing and adapted for resilient flexure for pivotally moving said spring contact means into or out of electrical communication with said conductive posts and said circuit conductors; and
cam means adjacent to said contact holder means for resiliently flexing said contact holder means.

4,477,134
ELECTROSTATIC DISCHARGE PROTECTED INTEGRATED CIRCUIT MODULE

Allen J. Wright, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 293,036, Aug. 14, 1981, abandoned.
This application Feb. 6, 1984, Ser. No. 576,788
Int. Cl.³ H01R 23/66, 23/70
U.S. Cl. 339—17 F 6 Claims

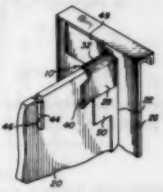


1. An electrostatic discharge protected integrated circuit module for use with an electronic device having a plug connector comprising:
an integrated circuit having contact leads;
a receptacle containing the integrated circuit having an opening for receiving the plug connector of the electronic device;
flexible circuit means within the receptacle for providing electrical connections to the integrated circuit, having conducting traces connected to the contact leads;
a conducting surface in the receptacle for electrically shorting together the traces; and
spring means in the receptacle for automatically urging the traces against the plug connector when the plug connector is inserted into the opening of the receptacle and for automatically urging the traces against the conducting surface when the plug connector is not inserted.

4,477,135
RETAINER FOR PRINTED CIRCUIT BOARDS

Stephen R. Pronto, Streamwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 16, 1982, Ser. No. 450,572
Int. Cl.³ H01R 4/66
U.S. Cl. 339—14 R 9 Claims



1. A retainer for holding a printed circuit board which includes a forward edge and an adjoining side edge at a corner of the board, comprising:
retaining means including a channel-shaped member having two leg portions and a bight portion, for receiving a forward portion of the board adjacent said forward edge on insertion of the board into the retainer, said bight portion for locating said side edge of the board and said leg portions for clamping opposite faces of the board;
lead-in means, comprising an outwardly flared lip extending along one side edge of one of said leg portions generally perpendicular to said bight portion, for engaging said forward edge of the board during insertion thereof and guiding the board into said retaining means; and
locking means for engaging a complementary locking surface on the board to hold the board in located position in said retaining means after insertion of the board thereinto,
said locking means comprising a resilient extension of the other of said leg portions extending generally parallel to said other bight portion.

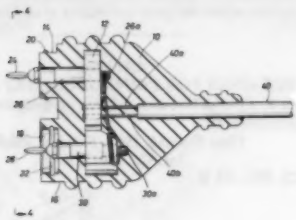
4,477,136
TAKEOUT CONNECTOR

J. David Smith, Sugarland, Tex., assignor to Mark Products Incorporated, Houston, Tex.

Filed Oct. 29, 1982, Ser. No. 437,688
Int. Cl.³ H01R 25/00
U.S. Cl. 339—49 R 2 Claims

1. A takeout connector for connecting a string of geophones to a main cable or to a main cable through another takeout connector comprising a body of elastomeric material having in side-by-side relationship, first and second protruding cylindrical portions, said second portion having a cavity for receiving the first cylindrical portion of another connector, means carried by one of the cylindrical portions for forming a seal with the cylindrical portion of another connector with which it is assembled, a stress member embedded in the body of elastomeric material, male plugs and female sockets mounted on the stress member with a male plug and a female socket positioned side-by-side in each of the cylindrical sections, said male plugs and female sockets being further positioned to be in common parallel planes so that the male plug and female socket in the cylindrical portion of one cylindrical portion can be electri-

cally connected to the male plug and female socket of another takeout connector and the other male plug and female socket



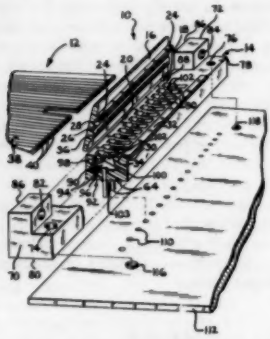
in the other cylindrical portion can be electrically connected to a cylindrical portion of yet another takeout connector.

4,477,137

ZERO INSERTION FORCE CONNECTOR FOR FLAT CABLE

George E. Ayer, Naperville, Ill., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 23, 1982, Ser. No. 410,678
Int. Cl.³ H01R *9/07*
U.S. Cl. 339—59 M **2 Claims**



1. A connector for a flat multiconductor cable, comprising:

a first portion, said first portion defining a support surface for supporting a predetermined longitudinal portion of said cable;

said support surface having a first planar portion and a second contoured portion, said second contoured portion extending in the lateral direction of said cable when said cable is supported on said support surface;

positioning means for positioning said cable upon said support surface when said cable is supported on said support surface, said positioning means engaging first and second lateral edges of said cable, said cable having first and second lateral edges;

an array of electrical contact members retained in said first portion and protruding from said support surface in spaced-apart, electrically-insulated relationship to one another, each said electrical contact member being disposed to be aligned with a predetermined different conductor of said flat multiconductor flexible cable when said positioning means are engaging said first and second lateral edges of said cable;

a clamping member for urging said cable against said array of contacts;

said clamping member defining a clamping surface, said clamping surface defining a third contoured portion complimentary in configuration to said second contoured portion;

said connector including holding means for retaining said clamping member with said clamping surface in fixed pressured interfitting complimentary relationship with said support surface after said cable has been positioned on said support surface to restrain motion of said cable in the longitudinal direction of said cable with respect to said connector by forcing said cable into substantial conformity with said second contoured portion and said third contoured portion and to effect an electrical connection between each of said contact members and a correspondingly different conductor of said flat multiconductor flexible cable;

said positioning means further including at least one cable notch guide member extending from said support surface intermediate said first and second lateral edges of said cable when said cable is supported on said support surface for engaging a longitudinally-extending notch defined in a laterally-extending and surface of scid cable;

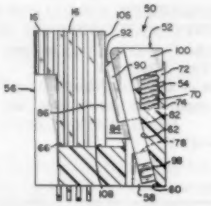
said positioning means including said notch guide means and being defined by a plurality of openings defined in a hinge means, said holding means including said hinge means.

4,477,138

CARD BIASING DEVICE FOR CARD EDGE CONNECTORS

Howard W. Andrews, Jr., Hershey; Timothy B. Billman, Carlisle, and Robert F. Cobaugh, Elizabethtown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 31, 1982, Ser. No. 364,170
Int. Cl.³ H01R *13/20*
U.S. Cl. 339—65 **26 Claims**

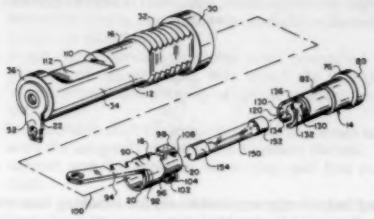


1. A card edge connector (56) having a card biasing device (50) at one end of a longitudinal, card-receiving slot (66), characterized in that the biasing device (50) comprises a passage (58) located adjacent one end of the card-receiving slot (66) and having a transverse rear wall (62) sloping obliquely downwardly towards a near end wall (74) of the connector (56) and a wedge (52) slideably positioned in the passage (58) and having a sloping surface (82) conformably sliding along the sloping transverse wall (82) of the passage (58) and a vertical surface (86) opposite the sloping surface (82) and facing into the slot (66) for abutting engagement with a card (16) which may be inserted into the slot (66) and means (54) for biasing the wedge (52) upwardly in the passage (58).

4,477,139
SHOCK PROOF FUSEHOLDER

Angelo Urani, St. Louis, Mo., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Jul. 12, 1982, Ser. No. 397,679
Int. Cl.³ H01R 19/24
U.S. Cl. 339—88 R 6 Claims

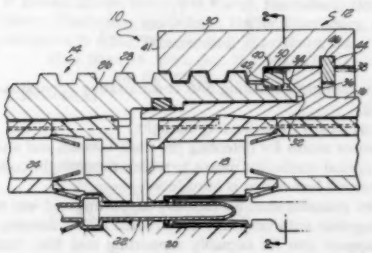


1. A holder for an electric fuse comprising a hollow cylindrical base and a hollow cylindrical head, said head dimensioned for receipt in said base, said base including a side terminal and a rear terminal, said side terminal having at least one "U" shaped finger opening in the direction of the central axis of said cylindrical base, said finger including a protuberance extending from the bight of said "U" shaped finger in the direction of the legs of the U into the interior of said finger, said head including a conductive bayonet insert, said bayonet insert including at least one "J" shaped arm which is contoured to lie within a cylindrical arc, said cylindrical arc having a central axis coincident with said central axis of said cylindrical base, said "J" shaped arm being dimensioned to be received within said "U" shaped finger when said head is inserted into said base and rotated, said protuberance being positioned to make continuous electrical contact with said arm when said arm is received within said finger.

4,477,140
SELF-LOCKING CONNECTOR

Hermenegildo A. Espiritu, Cerritos, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Feb. 7, 1983, Ser. No. 464,238
Int. Cl.³ H01R 13/623
U.S. Cl. 339—89 M 10 Claims



1. A connector member adapted to mate with a second connector member having a plurality of detent recesses spaced around at least a portion of its forward mating end comprising:

a barrel having rotatable coupling means thereon for drawing said connector members into mating engagement;

self-locking means associated with said coupling means activated near the end of the mating engagement of said connector members for resisting rotation of the coupling means in the uncoupling direction of rotation thereof;

said self-locking means including a radially resilient locking ring;

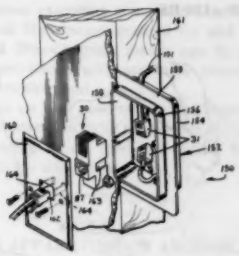
said locking ring being fixed to rotate with said coupling means; and

said ring having at least one inwardly extending tooth thereon positioned so that said tooth engages with at least one of said detent recesses near the end of said mating engagement.

4,477,141
TRICOUPLER FOR MODULAR WIRING SYSTEMS

Edwin C. Hardesty, Perry Hall, Md., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Nov. 19, 1982, Ser. No. 442,931
Int. Cl.³ H01R 25/00
U.S. Cl. 339—122 R 18 Claims



1. A tricoupler for modular wiring systems, said tricoupler comprising:

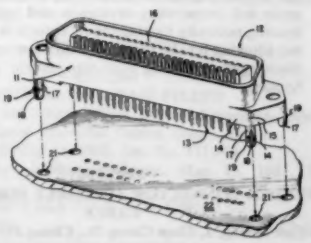
a housing which is made of a dielectric material, said housing including first, second and third modular plug-receiving cavities; and

a wire-like contact element which is made of a relatively resilient metallic material and which is mounted in said housing, said wire-like contact element including one end portion which extends into said second cavity, another end portion which extends into said third cavity, and a loop which extends from the vicinity of said third cavity, through said first cavity toward said second cavity, and which is controlled to deflect sufficiently without permanent deformation to develop suitable contact pressure when engaged by a terminal of a modular plug that is inserted into said first cavity.

4,477,142
FASTENER

Ralph M. Cooper, Clemmons, and Warren J. Pegram, Kernersville, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

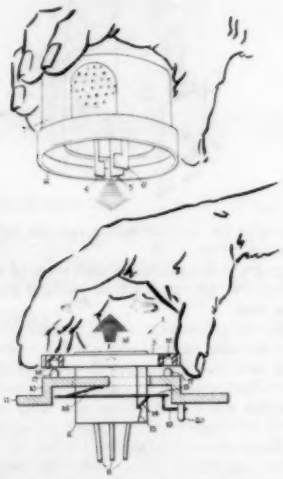
Filed Mar. 29, 1983, Ser. No. 480,043
Int. Cl.³ H02B 1/02
U.S. Cl. 339—125 R 3 Claims



1. A fastener moulded in one piece from resilient insulating material comprising a body portion having upper and lower faces, and side faces, the peripheries of which define an envelope extending perpendicularly to the upper and lower faces, a tubular mounting post depending from the lower face and being formed with a slot extending along a side portion of the post adjacent a side face so that the post has a transverse cross-

section of a C-spring, surface portions of the post adjacent each side of the slot and aligned with the envelope being formed with upwardly facing latch shoulders located only outside the envelope.

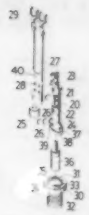
4,477,143
ORIENTABLE TWISTLOCK RECEPTACLE
Carl D. Taylor, Hendersonville, N.C., assignor to General Electric Company, Schenectady, N.Y.
Filed Dec. 3, 1982, Ser. No. 446,806
Int. Cl.³ H01R *13/642*
U.S. Cl. 339—126 RS **6 Claims**



1. An electrical receptacle of the twistlock type adapted to receive a photoelectric controller, comprising:
- a body portion of insulating material having overreaching shoulders which together with the body portion define a disc-like top portion, said body portion being insertable into an accommodating aperture in a luminaire housing,
- through passages in said body portion terminating in arcuate slots in said top portion, said passages containing terminals accessible through said slots to male terminals of the photoelectric controller,
- retaining means for resiliently holding the underside of said top portion against said housing, and keying protuberances and cooperating cavities in said underside and said housing normally locking the receptacle in one orientation but allowing it to be turned to a different orientation when disengaged by lifting said top portion away from the housing.

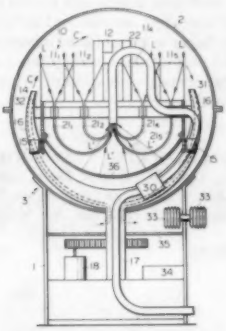
4,477,144
FEEDER CONNECTOR ASSEMBLY FOR COAXIAL CABLE
Chi-Hao Huang, 1, Chen Chung St., Chung Ho Li, Chang Hua City, Taiwan (500)
Filed Mar. 12, 1982, Ser. No. 357,797
Int. Cl.³ H01R *17/18*
U.S. Cl. 339—177 R **6 Claims**

1. Feeder connector assembly for a coaxial cable comprising a body portion for attachment to a coaxial cable and housing a contact reed, a terminal board having a pair of terminals and a base board mounting said terminal board on said body portion, said base board comprising a sheet metal die stamping having an annular inner end portion seating on said body portion and secured thereto, an outer end portion having lugs received in



matching holes in the terminal board for attaching said terminal board to said base board and an intermediate portion having means for mounting a transformer and capacitor on said base board.

4,477,145
SUNLIGHT COLLECTING AND CONCENTRATING APPARATUS
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan
Filed Jan. 25, 1983, Ser. No. 460,847
Claims priority, application Japan, Jul. 5, 1982, 57-116643
Int. Cl.³ G02B *5/16*
U.S. Cl. 350—96.10 **9 Claims**



1. A sunlight collecting and concentrating apparatus comprising:
- a lens means for collecting sunlight;
- a sensor means for detecting the sun's azimuth and altitude;
- an optical conductor means to which the sunlight collected by said lens means is introduced;
- a first rotatable shaft for turnably supporting said lens means together with integrally constructed means thereto;
- a support arm for turnably supporting said first rotatable shaft;
- a second rotatable shaft for turnably supporting said support arm about an axis perpendicular to the axis of said first rotatable shaft; and
- a capsule, in which all of the above are hermetically sealed; wherein when the sun's azimuth and altitude are detected by said sensor means, the turning of said first and second rotatable shafts is controlled to cause said lens means to face the position of the sun so as to introduce the collected sunlight by said lens means into said optical conductor means; characterized in that:
- a suction pump or blower is provided within said capsule so as to produce an air current around said sensor means, and

to effectively maintain the temperature around the sensor means to a proper level.

9. In a sunlight collecting and concentrating apparatus comprising:

a plurality of lenses for collecting sunlight;

a tracking sensor for detecting the sun's azimuth and altitude;

a plurality of optical conductor cables oppositely disposed to respective lenses, into which the sunlight collected by the lenses are introduced;

a single major optical conductor cable connected to said plurality of optical cables, into which the sunlight conveyed through said plurality of optical conductor cables is introduced;

a first rotatable shaft for turnably supporting lenses together with the integrally constructed members thereto;

a support arm for turnably supporting said first rotatable shaft;

a second rotatable shaft for turnably supporting said support arm about an axis perpendicular to the axis of said first rotatable shaft; and

a transparent capsule, in which all of the above are hermetically sealed;

wherein when the sun'azimuth and altitude are detected by said tracking sensor, the turning of said first and second rotatable shafts is controlled to cause lenses to face the position of the sun so as to introduce the collected sunlight by said lenses into said optical conductor cables; the improvment comprising:

at the rear side of the space formed by the plurality of lenses and optical conductor cables, a collecting and reflecting plate integrally turnable with said first rotatable shaft is provided and, substantially at the central position of the concentric circles formed by the plurality of lenses, the outlet ends of said optical conductor cables are connected to said single major optical conductor cable with its inlet end facing to the reflecting surface of said collecting and reflecting plate; said optical conductor cables being stripped of their cladding layers at least at portions adjacent to said central position, so as to introduce uncaptured light at the inlet ends of the optical conductor cables into said cables through the collecting and reflecting plate and to effectively maintain the temperature around the tracking sensor to a proper level.

4,477,146

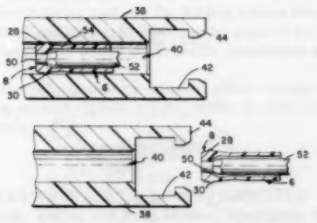
OPTICAL WAVEGUIDE CONNECTOR

Terry P. Bowen, Etters; Bernard G. Caron, Harrisburg; Douglas W. Glover, Harrisburg, and John C. Hoffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 16, 1981, Ser. No. 244,527

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.21 **8 Claims**



1. A connector for connecting optical fiber means of fiber optic cable means in axial alignment, comprising:

receptacle means having bore means extending therethrough, said bore means having a substantially constant diameter surface means therealong;

plug means having nose means, intermediate means and rear section means, said nose means, said intermediate means and said rear section means having axial bore means extending therethrough along which the fiber optic cable means will extend, said axial bore means along said nose means having opposed upper and lower profiled fiber-grasping means for grasping the optical fiber means of the fiber optic cable means therebetween, said fiber-grasping means being separated by transverse slot means extending through said nose means;

said nose means and said intermediate means having a diameter slightly less than said constant diameter surface means of said bore means of said receptacle means so that said nose means and said intermediate means with the fiber optic cable means extending along said axial bore means and the optical fiber means grasped by said upper and lower profied fiber-grasping means can be positioned along said bore means with said nose means disposed adjacent one another; and

protrusion means on said nose means and engagable with said surface means of said bore means to radially compress said fiber-grasping means onto the optical fiber means therein and axially align them.

4,477,147

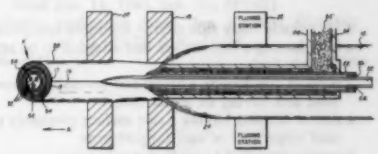
METHOD AND APPARATUS FOR ASSEMBLING AN OPTICAL FIBER COMMUNICATION CABLE

Joseph Winter, New Haven, and Michael J. Pryor, Woodbridge, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 395,443, Jul. 6, 1982, , and Ser. No. 413,846, Sep. 1, 1982, , which is a continuation-in-part of Ser. No. 324,242, Nov. 23, 1981, abandoned. This application May 24, 1983, Ser. No. 497,639

Int. Cl.³ G02B 5/16

U.S. Cl. 350—96.23 **24 Claims**



19. An optical fiber communication cable comprising:

a metal containment tube having an inner periphery;

said tube containig at least one optical fiber, said at least one optical fiber being spaced from said inner periphery; and

each said fiber being in static compression,

whereby said tube may undergo a tensile force substantially equal to said static compression without damaging said at least one fiber.

4,477,148

OPTICAL LOW-PASS FILTER

Sadahiko Tsuji, and Akira Tajima, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1982, Ser. No. 377,569

Claims priority, application Japan, May 13, 1981, 56-68073[U]

Int. Cl.³ G02B 27/00, 5/04; H04N 5/72

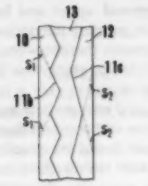
U.S. Cl. 350—286 **2 Claims**

1. An optical low-pass filter comprising:

(a) first and second transmission members respectively having a stripe micro prism formed on one surface thereof, said micro prism of the first transmission member having a shape different from that of the micro prism of the second transmission member; and

(b) a transmissive layer provided between the micro prism surface of the first transmission member and the micro

prism surface of the second transmission member, said transmissive layer filling up a space between the first and



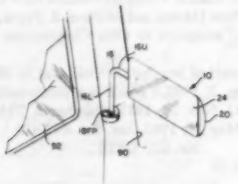
second transmission members and consisting of an adhesive having a refractive index different from that of air.

4,477,149

RESETTABLE MIRROR ASSEMBLY

Serge Crespy, P.O. Box 383, Collingwood, Ontario, Canada L9Y 3Z7

Filed Apr. 15, 1983, Ser. No. 485,326
Int. Cl.³ G02B 7/18, 5/08
U.S. Cl. 350—288 **20 Claims**



1. A vehicle body side mirror assembly comprising:
a base having a top surface and adapted to be attached to a vehicle body;
a support arm having a lower end pivotably mounted to said base and having an upper end;
a mirror housing having a side surface pivotably mounted to said upper end of said support arm;
a mirror mounted to said mirror housing;
cooperating mirror position adjustment indicia at said lower end of said support arm and on said base and operable to facilitate resetting of said support arm by pivoting to a previously determined position which resets said mirror to a corresponding previously determined position; and
cooperating mirror angle adjustment indicia at said upper end of said support arm and said side surface of said mirror housing and operable to facilitate resetting of said mirror housing by pivoting to a previously determined angle which resets said mirror to a corresponding previously determined angle.

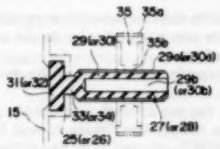
4,477,150

ELECTRIC REMOTE CONTROL REARVIEW MIRROR

Susumu Usami, Nagoya; Nobuyuki Teranishi, Mie; Tomohisa Kuwako, Anjo; Ikuo Sugiyama, Gifu; Yoshio Tsujiuchi, Kuwana, and Shigeo Hara, Inuyama, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishi, Japan

Continuation-in-part of Ser. No. 192,599, Sep. 30, 1980, Pat. No. 4,362,362. This application May 21, 1982, Ser. No. 381,006
Claims priority, application Japan, Oct. 17, 1979, 54-144090[U]; Oct. 19, 1979, 54-145052[U]
The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.
Int. Cl.³ G02B 7/18
U.S. Cl. 350—289 **10 Claims**

1. In an electric remote control rearview mirror assembly comprising, in combination, a mirror unit including a mirror support plate and a mirror having a reflective surface and a backside and supported by said mirror support plate with said backside facing thereto, a support casing positioned on one side of said mirror support plate remote from said mirror, a spherical mounting member positioned between said mirror unit and said support casing for clamping said mirror support plate thereon for pivotal movement around horizontal and vertical axes, a pair of sockets defined in said mirror support plate in spaced relation to said spherical mounting member and spaced a predetermined angle from each other with respect to said spherical mounting member, a pair of rod members pivotally secured first ends thereof in respective said sockets against rotational and axial displacement relative to said mirror support plate, said rod members protruding from said mirror support plate into said support casing, a pair of drive members



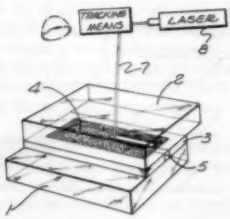
rotatably supported inside said support casing and held in driving engagement with respective end portions of said rod members inside said support casing, and electric drive means housed inside said support casing for selectively rotating said drive members to pivotally adjust said mirror unit about said spherical mounting member to adjust the angularity of said mirror unit with respect to the horizontal and vertical axes, the improvement wherein:
each said rod member is made of an elastic material and includes an elongated stem in the form of a hollow cylindrical member; and
each said drive member is made of a rigid material and includes means for engaging said stem of a respective said rod member, while enabling said rod member to easily deform to disengage from said drive member upon the application of a large force axially to said rod member.

4,477,151

SMECTIC LIQUID CRYSTAL CELL WITH HEAT PULSE AND LASER

Derek H. Mash, Harlow, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 28, 1981, Ser. No. 334,497
Int. Cl.³ G02F 1/133, 1/137
U.S. Cl. 350—351 **16 Claims**



9. A display system comprising:
a display cell having two plates defining a space filled with a layer of liquid material exhibiting a smectic phase, wherein the surfaces of said plates in contact with said layer cause the molecules of said layer adjacent said surface to assume a substantially visually clear state that is a

substantially ordered state when said layer is taken by slow cooling into a smectic phase from a less-ordered phase in the absence of an applied electric field,

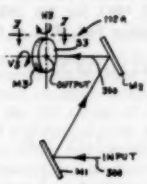
a flash source for illuminating substantially all of said layer with a flash of light at a predetermined flux density to provide said layer with a short duration heat pulse which causes the illuminated part of said layer to enter the isotropic state and return to a smectic phase sufficiently rapidly for said layer to assume and retain a light-scattering disordered molecular arrangement of molecules in the smectic phase thereby providing a more or less uniform background, and

means for thereafter writing on said background by traversing a focused laser beam over selected portions thereof, thereby leaving a visible track over said background.

4,477,152
REDUCTION OF SIGNAL MODULATION CAUSED BY POLARIZATION IN VISIBLE OPTICAL SCANNING SYSTEMS

Matthew R. Comer, Pasadena, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 26, 1982, Ser. No. 382,068
Int. Cl.³ G02F *1/01*; G02B *27/28*
U.S. Cl. 350—394 **7 Claims**



1. A method of minimizing the polarization modulation effect of an optical scanner system which is in earth orbit and is scanning the earth wherein said system includes a plurality of optically aligned rotatable flat folding mirrors having incident angle normals in the same plane, said plurality of rotatable flat folding mirrors being optically aligned with one another from closest to an input image beam to furthest away from said input image beam, with said mirrors serially reflecting said image beam acquired by the scanning of said system in orbit, said method comprising the steps of:

a. rotating the one of said flat folding mirrors optically aligned furthest away from said input image beam around its vertical geometric axis, such that the reflecting surface of said one flat folding mirror is perpendicular to said image beam impinging thereon; and

b. thereafter, rotating said one flat folding mirror around its horizontal geometric axis, such that the angle of incidence of said impinging image beam is of a preselected magnitude;

whereby the polarization modulation effect caused by the scanning of said optical system while in earth orbit is minimized.

4,477,153
ULTRAWIDE ANGLE ZOOM OBJECTIVE

Shigeyuki Suda, Tokyo, and Keiji Ikemori, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1982, Ser. No. 375,667
Claims priority, application Japan, May 20, 1981, 56-76301
Int. Cl.³ G02B *13/04*
U.S. Cl. 350—426 **5 Claims**

1. An ultrawide angle zoom objective having the following conditions:

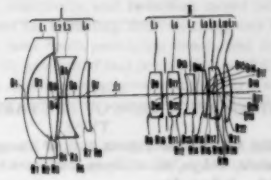
two lens components of which the first counting from the front is of negative power and the second is of positive power;

an air separation between said first and said second lens components being made variable to effect zooming,

said first lens component consisting of four lens elements from front to rear, the first being frontmost and the fourth being rearmost,

the first lens element being a meniscus lens of negative power convex toward the front,

the second lens element being a bi-convex lens,



the third lens element being a bi-concave lens with its rear surface having a stronger refractive power,

the fourth lens element being a lens of positive power with its front surface convex toward the front,

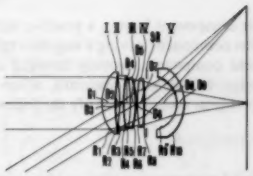
the absolute value of the radius of curvature of the rear surface of said second lens being larger than the absolute value of the radius of curvature of the front surface of said third lens, and

said first lens element having an aspheric surface.

4,477,154
PHOTOGRAPHIC OBJECTIVE

Yasuhisa Sato, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1982, Ser. No. 387,451
Claims priority, application Japan, Jun. 27, 1981, 56-99862
Int. Cl.³ G02B *9/60, 13/18*
U.S. Cl. 350—432 **2 Claims**



1. A photographic objective having the following various conditions:

having five lens components, in order from front to rear,

the 1st lens components being a meniscus lens of positive refractive power convex toward the front,

the 2nd lens component being a lens having a negative refractive power,

the 3rd lens component being a meniscus lens of positive refractive power convex toward the rear,

the 4th lens component being a lens having a positive refractive power, and

the 5th lens component being a meniscus lens of negative refractive power convex toward the rear,

said objective satisfying the following conditions:

$$0.4<f_{IV}/f<0.9$$

$$3<(r_5+r_6)/(r_5-r_6)<9$$

$$1.55<(n_3+n_4)/2<1.75$$

wherein

f_β: the overall focal length of said 1st to said 4th lens components,

f: the focal length of the entire lens system,

r_5 and r_6: the radii of curvature of the front and rear lens surfaces of said 3rd lens component respectively, and

n_3 and n_4: the refractive indices of the glasses of the said 3rd and said 4th lens components respectively.

4,477,155

PHOTOGRAPHIC LENS OF THE PARTIAL FOCUSING TYPE

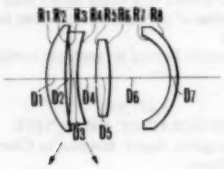
Yasuhisa Sato; Hideo Yokota, both of Kanagawa, and Yasuyuki Yamada, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1982, Ser. No. 448,807

Claims priority, application Japan, Dec. 21, 1981, 56-207680

Int. Cl.³ G02B *9/34*

U.S. Cl. 350—469 **3 Claims**



1. A photographic objective comprising from front to rear:

a first lens component having a positive refractive power convex toward the front;

a second lens component having a negative refractive power;

a third lens component having a positive refractive power;

a fourth lens component having a negative refractive power;

the first lens component moving forward and the second lens component moving rearward, when focusing on a close-up object, such as to satisfy the following condition:

$$0.5 < |\Delta 2/\Delta 1| < 3.5$$

in which $\Delta 1$ represents an amount of movement of the first lens component while $\Delta 2$ represents an amount of movement of the second lens component.

4,477,156

REFLECTING TELESCOPE WITH CORRECTING LENS

Rolin J. Gebelein, 291 Martin Rd., Santa Cruz, Calif. 95060, and David Shafer, Fairfield, Conn., assignors to Rolin J. Gebelein, Santa Cruz, Calif.

Filed Oct. 29, 1981, Ser. No. 316,134

Int. Cl.³ G02B *23/02, 17/08*

U.S. Cl. 350—503 **11 Claims**

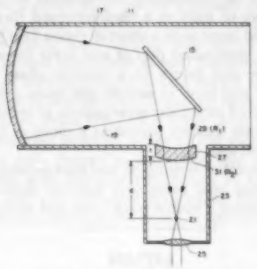
1. A reflecting telescope comprising:

a housing;

a parabolic reflecting mirror at one end of said housing for forming a focused image of light incident on said mirror;

a viewing lens through which a user may view said image;

a single element meniscus lens located in said housing and configured to simultaneously correct said image for coma



aberration of said parabolic mirror and for spherical aberration and coma aberration of said viewing lens.

4,477,157

UNIVERSAL REVOLVING STAGE FOR MICROSCOPES

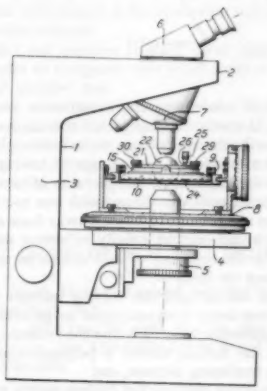
Norbert Gaul, Solms, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 393,726

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1981, 8119558[U]

Int. Cl.³ G02B *21/26*

U.S. Cl. 350—532 **4 Claims**



1. A universal revolving stage for microscopes, comprising:

upper and lower glass segments positioned one above the other;

a lower segment mounting in which the lower glass segment is mounted, said lower segment mounting having a threaded portion;

a rotatable adjusting ring surrounding said lower segment mounting and having a threaded portion which engages the threaded portion on said lower segment mounting to cause vertical movement of said lower segment mounting in response to rotation of said adjusting ring;

an upper segment mounting in which the upper glass segment is mounted;

means for releasably attaching said upper segment mounting in a centered position in said lower mounting;

an adjusting means, actuatable from above said lower segment mounting, for rotating said adjusting ring, whereby

both said upper and lower segment mountings are adjusted in height; and

an adjusting element which is selectively insertable into and removable from said adjusting means.

4,477,158

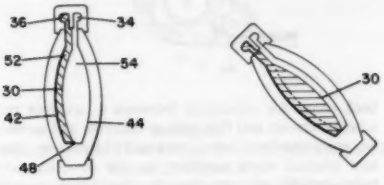
LENS SYSTEM FOR VARIABLE REFRACTION

Stephen C. Pollock, 7206 Oak St., Apt. 1-SW, River Forest, Ill. 60305; James M. Grisolano, Jr., c/o Office of Medical Education, St. Francis Hospital, 355 Ridge Ave., Evanston, Ill. 60202, and Gholman A. Peyman, 535 N. Michigan Ave., Apt. 3001, Chicago, Ill. 60611

Filed Oct. 15, 1981, Ser. No. 311,663

Int. Cl.³ G02B *1/06, 3/12;* **G02C** *7/04, 7/06*

U.S. Cl. 351—169 **33 Claims**



1. A lens system for variable refraction having an optical zone for refracting light rays, said system comprising a solid housing that is transparent at least throughout said optical zone; a single closed chamber within said housing having a portion spanning the full extent of said optical zone and a portion outside of said optical zone; a plurality of immiscible liquids completely filling said chamber, at least two of said liquids being transparent, said transparent liquids having different refractive indices and forming between themselves an interface that is disposed substantially perpendicular to the optical axis of said system at all times, said contained liquids having preselected densities so that tilt of the system relative to the earth results in interdisplacement of said contained liquids within said chamber and a change in the contour of said interface in said optical zone so as to produce a change in the refractive power of said system over a continuous range, the sole impetus for said interdisplacement being gravitational force.

4,477,159

PHOTOCOAGULATOR

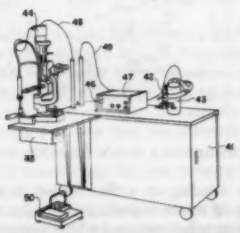
Katsuyoshi Mizuno, Izumi, and Akira Ihara, Gamagori, both of Japan, assignors to Nidek Co., Ltd., Aichi, Japan

Filed Nov. 5, 1981, Ser. No. 318,593

Claims priority, application Japan, Nov. 6, 1980, 55-156207; Jun. 30, 1981, 56-102691

Int. Cl.³ A61B *3/10*

U.S. Cl. 351—221 **4 Claims**



1. A photocoagulator including an opthalmoscope and a slit lamp, both of which are adapted to direct a laser beam and illumination light to a lesion on a patient's fundus oculi comprising:

i. means for producing a laser beam;

ii. first fiber means for guiding said laser beam to said opthalmoscope;

iii. second fiber means for guiding said laser beam to said slit lamp;

iv. means for switching said laser beam from said laser beam producing means so as to direct the laser beam to said first or second fiber, selectively, said switching means including a penta prism for refracting and reflecting said laser beam from said laser beam producing means, and means for controlling the position of said penta prism so that said laser beam from said laser beam producing means is selectively directed to said first or second fiber means through a penta prism;

whereby the treatment of photocoagulation can be suitably made in accordance with positions of a lesion on the patient's fundus oculi.

4,477,160

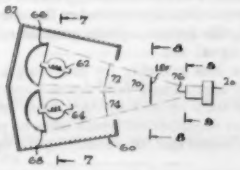
MOTION PICTURE SYSTEM

Douglas Trumbull, Santa Monica, Calif., assignor to Showscan Film Corporation, Marina del Rey, Calif.

Continuation-in-part of Ser. No. 885,901, Mar. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 713,658, Aug. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 626,965, Oct. 29, 1975, abandoned. This application Aug. 26, 1982, Ser. No. 412,040

Int. Cl.³ G03B *21/32*

U.S. Cl. 352—40 **5 Claims**



1. A method for producing a motion picture image that creates a heightened physiological response in observers comprising:

exposing a strip of light sensitive film through a camera lens to form images on individual film frames spaced along the length of the film, at a predetermined constant frame rate; and

projecting said film strip onto a screen, while advancing said strip at the same frame rate as the one at which the film was exposed;

said step of exposing and projecting including creating images on said film having a resolution of more than 40 line pairs per milimeter and a frame area of at least 0.36 square inch;

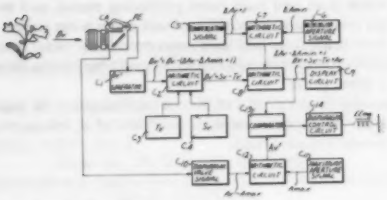
said step of projecting includes producing an illumination level greater than 16 foot lamberts on said screen; and

said constant frame rate is from 50 frames per second to 72 frames per second, inclusive.

4,477,161
COMPENSATOR SYSTEM FOR DIAPHRAGM CONTROL IN A SINGLE-LENS REFLEX CAMERA OF INTERCHANGEABLE LENS TYPE

Masahiro Kawasaki, Tokyo; Zenichi Okura, Ichikawa, and Fumio Urano, Omiya, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1981, Ser. No. 229,879
Claims priority, application Japan, Jan. 31, 1980, 55-10978
Int. Cl.³ G03B 7/085
U.S. Cl. 354—448 **6 Claims**



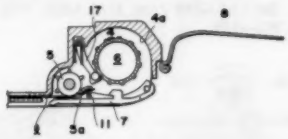
1. A camera comprising:
a camera body;
a lens assembly insertable into the camera body, the lens assembly having a displaceable actuator and a diaphragm adjustable between a maximum aperture value and a minimum aperture value responsive to displacement of the actuator;
means for generating a first signal representative of the displacement of the actuator;
means for generating a second signal in the lens assembly, the signal being selected from a series of fully opened aperture values and representative of an approximate fully opened aperture value;
means for connecting the second signal to the camera body;
means in the camera body for generating a third signal representative of the desired aperture value of the diaphragm for correct exposure;
means in the camera body for comparing the sum of the first and second signals with the third signal;
means in the camera body for displacing the actuator upon shutter release;
means responsive to the comparing means for arresting the displacement of the actuator when the sum of the first and second signals assume a predetermined relationship with the third signal; and
means in the lens assembly for providing a difference between the approximate fully opened aperture value and the actual fully opened aperture value as a quantity of preliminary displacement which takes no part in stopping down the diaphragm for controlling the light quantity.

4,477,162
CAMERAS WITH A FILM LOADING DEVICE FOR FACILITATING FILM LOADING

Toshiaki Matsumoto, Izumisano, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 2, 1982, Ser. No. 403,998
Claims priority, application Japan, Aug. 5, 1981, 56-121901; Sep. 4, 1981, 56-138376
Int. Cl.³ G03B 1/24
U.S. Cl. 354—173.11 **19 Claims**

1. A camera for use with a roll film housed in a film cartridge and having sprocket holes in the lengthwise direction, camera comprising:
a film take-up chamber;
a film cartiridge chamber capable of receiving the film cartridge;
an exposure station having an exposure aperture;
a sprocket having sprocket pawls engageable with sprocket holes of the film withdrawn from the film cartridge past said exposure station for transportation of the film toward said film take-up chamber;
a spool disposed in said film take-up chamber and having means for enabling the winding of a leader portion of the film around said spool;
a back cover supported for movement between a covering position where it covers said film take-up chamber, said film cartridge chamber and said exposure station and an uncovering position where it uncovers said film take-up chamber, said film cartridge chamber and said exposure station;
an internal cover member supported independently of said

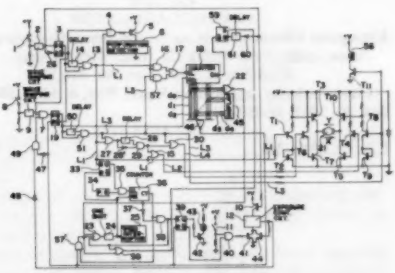


back cover for movement between a covering position where it covers said film take-up chamber and an uncovering position where it uncovers said film take-up chamber, said internal cover member, in said covering position, being capable of contacting the film for preventing the sprocket hole of the film having engaged one of said sprocket pawls from being disengaged therefrom; and
locking means for releasably locking said internal cover member in said covering position, said locking means being interlocked with said back cover to be disabled for releasing said internal cover member in response to the movement of said back cover from said uncovering position to said covering position.

4,477,163
FILM TRANSPORTING DEVICE FOR USE IN A CAMERA

Toshiaki Matsumoto, Izumisano, and Nobuyuki Taniguchi, Tondabayashi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 19, 1982, Ser. No. 435,217
Claims priority, application Japan, Oct. 20, 1981, 56-168242[U]
Int. Cl.³ G03B 1/18, 17/36
U.S. Cl. 354—173.11 **28 Claims**



1. A film transporting device for use in a camera, comprising:
means for winding-up a film loaded in the camera, said winding-up means including a sprocket which has a plurality of sprocket teeth and which is rotatable for winding-up the film with the sprocket teeth being engaged in perforations of the film;
means for detecting said perforations at a detecting position

before the sprocket with respect to the direction of wind-up of the film, said perforation detecting means being adapted to produce a pulse upon detection of each of said perforations;

means for counting the number of pulses from said perforation detecting means;

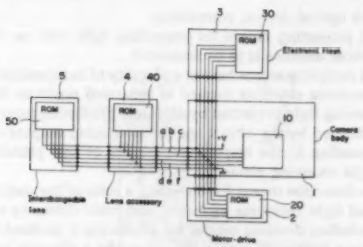
means for rewinding the film;

means for generating a signal for interrupting the film rewind operation of said rewinding means in response to the number of the pulses counted by said counting means, said signal generating means being adapted to generate said signal when the film would be withdrawn from the sprocket.

4,477,164
CAMERA SYSTEM OPERABLE IN ACCORDANCE WITH STORED MEMORY

Masaaki Nakai, Nara; Masayoshi Sahara, Sennan, and Nobuyuki Taniguchi, Tondabayashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 10, 1982, Ser. No. 448,834
Claims priority, application Japan, Dec. 17, 1981, 56-204972
Int. Cl.³ G03B *17/00*
U.S. Cl. 354—286 **29 Claims**



23. In a camera system operable in accordance with memory data by means of carrying the memory data from a camera accessory to a camera body, the camera accesory comprising:

first means for receiving electric power from the camera body;

second means for receiving a train of clock pulses from the camera body;

a read-only memory for storing the memory data;

third means for receiving a controlling signal from the camera body;

means for parallelly reading the memory data from said read-only memory and for serially outputting the read memory data in response to the clock pulses, said reading and outputting means including means responsive to the controlling signal for enabling the serially outputting operation during the time that the controlling signal is being received; and

means for serially transmitting the read memory data toward the camera body.

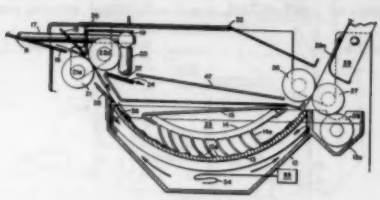
26. The camera system according to claim **23**, wherein the camera accessory consists of an exchangeable objective lens.

27. The camera system according to claim **26**, wherein said read-only memory includes data representative of a fully open aperture size of the exchangeable objective lens.

4,477,165
DIFFUSION TRANSFER PROCESSOR

Clifton L. Spence, Woodbridge, Va., and Walter Lissiuk, Silver Spring, Md., assignors to LogEtronics, Inc., Springfield, Va.

Filed Aug. 17, 1983, Ser. No. 524,052
Int. Cl.³ G03D *9/00*
U.S. Cl. 354—299 **9 Claims**



1. A diffusion transfer processor comprising:

a pair of feed rollers for receiving a print medium and an exposed image-bearing photographic sheet for printing on said medium, said rollers positionable to feed said photographic sheet and said print medium initially in different directions;

a first developing path having an entrance facing said rollers and in a direction to receive said photographic sheet, and an exit; said path extending through a container of activating solution and having a solid bottom arcuate guide portion provided with a plurality of raised protrusions, and a plurality of flexible vane members supported in contact with said protrusions and deflectable upon passage of said film sheet along said bottom guide portion, deflection of said vane members providing local agitation of said developer solution;

a print medium path including an entrance facing said rollers and in a direction for receiving said print medium, and an exit coplanar with an exit of said first developing path;

a pair of laminating rollers disposed at said exits for receiving said print medium and said photographic film sheet concurrently, said laminating rollers pressing said film sheet and print medium together as they exit said paths; and

a moistening roller supported for rotation in a moistening fluid chamber and in contact with one of said laminating rollers for moistening said laminating rollers.

4,477,166
DIAZO PRINTER WITH IMPROVED AMMONIA SUPPLY SYSTEM

Roger S. Funk, Hollcong, Pa., assignor to R. Funk and Co., Inc., Doylestown, Pa.

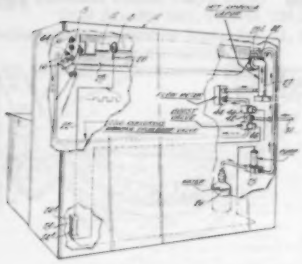
Filed Nov. 24, 1982, Ser. No. 444,492
Int. Cl.³ G03D *7/00*
U.S. Cl. 354—300 **4 Claims**

1. Apparatus for producing a controlled rate of supply of ammonia to the developer chamber of a diazo printer which includes a variable-speed rotary drive member for moving the copy paper through the developer chamber of the printer, at a variable speed, said rotary drive member varying in speed between a first low range of speeds and a second high range of speeds, said apparatus comprising:

transducer means responsive to operation of said rotary drive member for producing a train of electrical pulses having a repetition rate proportional to the speed of said rotary drive member;

electronic circuit means responsive to said train of electrical pulses for producing a control signal indicative of whether said repetition rate is in a first low range corresponding to said first low range of speeds of said rotary drive member or in a second high range corresponding to said second high range of speeds of said rotary drive member;

conduit means for supplying a flow of ammonia to said developer chamber of said last-named means, comprising electrically-controlled valve means responsive to said control signal for increasing the rate of flow of ammonia



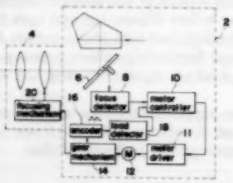
to said developer chamber when said control signal indicates that said repetition rate is in said second high range and for decreasing said ammonia flow rate when said control signal indicates that said repetition rate is in said first low range.

4,477,167

PROTECTIVE DEVICE FOR AUTOMATIC FOCUSING CAMERA

Norio Ishikawa, Osaka, and Yukio Miki, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 16, 1982, Ser. No. 442,187
Claims priority, application Japan, Nov. 16, 1981, 56-183948
Int. Cl.³ G03B *3/00*
U.S. Cl. 354—400 **12 Claims**



1. An automatic focusing device in a camera body capable of being coupled with an objective lens which is mountable on the camera body and which has a focusing lens unit movable along an optical axis of the objective lens by a focusing mechanism for focusing and which further has means for preventing the focusing lens unit from moving beyond either an infinity focusing position or its closest focusing position, said automatic focusing device comprising:

means for detecting the focusing condition of the objective lens relative to an object and producing a defocus signal indicating at least the defocus direction of the focusing lens unit with respect to its in-focus condition;

means for driving the focusing lens unit in a predetermined direction in response to said defocus signal;

means for transmitting the driving force of said driving means to the focusing mechanism provided in the objective lens in order to move the focusing lens unit along the optical axis for focusing;

means for detecting any overload condition in which the load for said driving means is increased over a predetermined level to produce an overload signal when the overload condition is detected;

means for interrupting the driving force to said driving means in response to said overload signal;

means for storing said defocus signal when said overload condition is detected, and

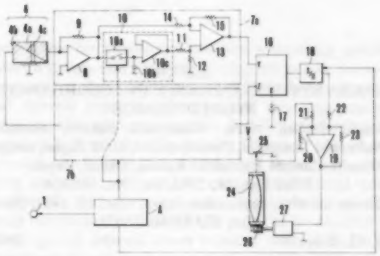
means for comparing a second defocus signal from said focusing condition detecting means with said stored defocus signal, whereby, if the second defocus signal is different from the stored one, said driving means is actuated for starting to drive the focusing lens unit in correspondence with the second defocus signal.

4,477,168

RANGE FINDER

Kazuya Hosoe, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,705
Claims priority, application Japan, Aug. 27, 1981, 56-134754
Int. Cl.³ G03B *13/20*; G01C *3/08*
U.S. Cl. 354—403 **12 Claims**



1. An optical deivce, comprising:

light projecting means for projecting light onto an object whose distance is to be measured;

light receiving means having a plurality of independent light receiving elements located at separated positions for receiving light projected by said light projecting means and reflected by the object and for producing outputs corresponding to the respective positions of said plurality of light receiving elements;

ratio detection means for detecting a ratio of the outputs of said light receiving elements, said ratio detecting means including dividing means; for producing a quotient; and

distance indicating means for indicating a distance to said object on the basis of said ratio of outputs detected by the output ratio detection means.

4,477,169

AUTOMATIC FOCUSING CAMERA SYSTEM AND PHOTOGRAPHING LENS STRUCTURE THEREFOR

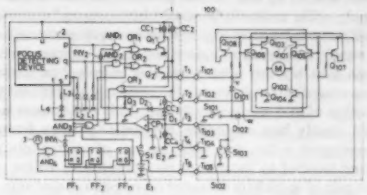
Nobuhiko Terui, Tokyo; Sakuji Watanabe, Warabi, and Hiroshi Meguro, Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 9, 1982, Ser. No. 396,724
Claims priority, application Japan, Jul. 14, 1981, 56-109863
Int. Cl.³ G03B *7/08*
U.S. Cl. 354—409 **6 Claims**

1. A camera having a lens structure with an imaging optical system and a camera body capable of accepting said lens structure and provided with focus detecting means for generating detection signals in response to the positional relationship between the image of an object formed by said imaging optical system and a predetermined plane and for displaying said positional relationship on a display, wherein said lens structure comprises means for adjusting said imaging optical system in response to said detection signals and first and second terminals for transmitting said detection signals to said adjusting means when said lens structure is mounted on said camera body, comprising:

control means provided on said lens structure and adapted to produce a control signal;

stopping means provided on said lens structure to terminate operation of said adjusting means in response to said control signal and to simultaneously transmit stop signals



through said first and second terminals to said camera body; and

means provided on said camera body for latching said display in response to the stop signals transmitted through said first and second terminals.

4,477,170

ANNUNCIATOR FOR FLASH PHOTOGRAPHING SYSTEM

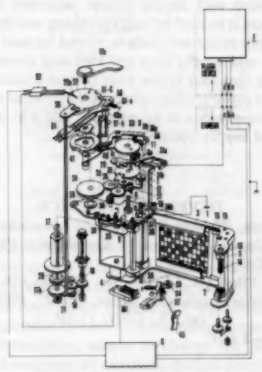
Masanori Yamada, and Makoto Katsuma, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 429,523

Claims priority, application Japan, Oct. 13, 1981, 56-163631

Int. Cl.³ G03B *15/03, 9/14, 7/08, 17/18*

U.S. Cl. 354—415 **8 Claims**



6. A flash photographing system comprising:

(a) light emitting means for producing flash light with which an object to be photographed has to be illuminated;

(b) a shutter having leading and trailing curtains;

(c) trigger means connected to said light emitting means to trigger the light emitting means when a test-firing of the system is performed;

(d) shutter driving means for the shutter to run down in a condition that no slit is formed between the leading curtain and the trailing curtain when in said test firing;

(e) light sensitive means positioned to receive said flash light reflected from said driven shutter when in said test firing, the light sensitive means producing an electrical signal proportional to the incident light;

(f) control signal producing means connected to the light sensitive means to produce a control signal when the electrical signal reaches a predetermined value; and

(g) an annunciator to be energized in response to the control signal.

4,477,171

ELECTRONIC FLASH SYSTEM

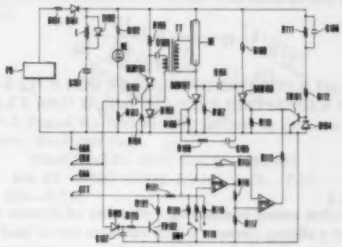
Masanori Yamada, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,600

Claims priority, application Japan, Jul. 29, 1981, 56-118633

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—416 **4 Claims**



1. A combination of a camera selectively attachable with a plurality of interchangeable lenses and an electronic flash device detachable from said camera, comprising:

(a) flash emitting means for emitting light to illuminate an object to be photographed;

(b) diaphragm means provided in each of said lenses, dynamic ranges of at least two of the diaphragm means being different from each other;

(c) diaphragm control means for controlling an aperture size of said diaphragm means of the attached lens on the basis of one of a plurality of aperture value signals to be applied from the outside of said camera;

(d) means provided in said electronic flash device and for selectively producing said aperture value signals to be applied to said diaphragm control means, one of the aperture value signals being out of the dynamic range of at least one of said lenses;

(e) light sensitive means responsive to the reflected light from the object after being passed through said diaphragm means controlled by said diaphragm control means and for generating a control signal when an amount of the reflected light has reached a predetermined level; and

(f) light control means for terminating emission of the light from the flash emitting means in response to the control signal from said light sensitive means.

4,477,172

LIGHT MEASURING DEVICE FOR CAMERA

Hideo Yokota, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,337

Claims priority, application Japan, Aug. 8, 1981, 56-124214

Int. Cl.³ G03B *7/099, 17/20;* **G02B** *5/04*

U.S. Cl. 354—480 **5 Claims**

1. A light measuring device for a camera comprising:

(a) light sensitive means for measuring a reflected light from a shutter surface or a film surface;

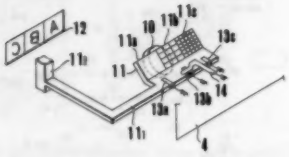
(b) a collection lens positioned in front of said light sensitive means, said collection lens conducting said reflected light to said light sensitive means;

(c) diffusing means provided with a plurality of diffusing portions, having different diffusing characteristic and different light measuring ranges, said diffusing means being movable so that one of the plurality of diffusing portions is positioned in front of said light sensitive means,

whereby one of the diffusing portions which lies in front of the light sensitive means and said collection lens in combination conducting said reflected light to said light sensitive means;

(d) changeover means for replacing one of the diffusing portions positioned in front of said light sensitive means by another diffusing portion;

(e) each diffusing portion of said diffusing means being colored, and having its color density and its thickness in a specific relation so as to minimize changes in the brightness of the light receiving surface of said light sensitive means when the diffusion characteristic is changed;



(f) switch means comprising a plurality of electric contacts and a sliding element which contacts one of said electric contacts, the number of said electric contacts corresponding to the number of said diffusing portions and said electric contacts being formed integratedly on the corresponding diffusion portions; and

(g) indicating means having a plurality of indicating portions which correspond to said diffusing portions and indicate light measuring ranges of the corresponding diffusing portions.

4,477,173

TONER REPLENISHING DEVICE FOR AN ELECTROSTATIC COPYING APPARATUS

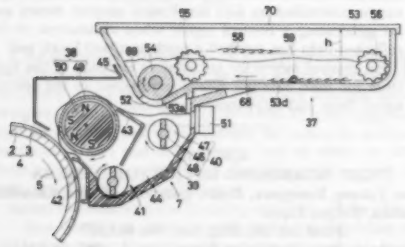
Nobuhiko Kozuka; Shigeo Koyama; Masami Kai; Ichiro Takahashi; Hiromi Sakata, and Atsushi Kano, all of Osaka, Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Jun. 30, 1982, Ser. No. 393,871

Claims priority, application Japan, Jun. 30, 1981, 56-102944

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 DD **2 Claims**



1. In a developing device for developing a visible toner image from an electrostatic latent image on a photosensitive surface in an electrostatic copying apparatus, said developing device being of the type including a storage container mounting therein a developing roller and to be positioned with said developing roller positioned adjacent the photosensitive surface, stirring means for agitating toner within said storage container and supplying the toner to said developing roller, and means for replenishing the supply of toner to said storage container, the improvement wherein said replenishing means comprises:

an elongated opening in an upper portion of said storage container at a position generally above said stirring means;

a toner supply box having a supply end with a convexly downwardly curved bottom portion, an elongated supply port formed in said bottom portion, a bottom wall extending from said bottom portion, and a pair of parallel side walls spaced by said bottom portion and said bottom wall;

a supply roller rotatably mounted between said side walls in said bottom portion adjacent said supply port;

said supply box being mounted above said storage container with said bottom portion of said supply box extending downwardly through said elongated opening in said upper portion of said storage container, with said bottom wall of said supply box extending horizontally away from said developing roller, and with the axis of said supply roller being parallel to the axis of said developing roller;

a first pair of sprockets mounted on respective said side walls at positions adjacent said supply roller to have a common horizontal axis parallel to said axis of said supply roller;

a second pair of sprockets mounted on respective said side walls at positions spaced from said supply roller to have a common horizontal axis parallel to said axis of said supply roller;

a pair of chains passing around respective said sprockets of said first and second pairs thereof at positions adjacent respective said side walls, such that said chains have respective lower runs and upper runs;

a stirring and supply rod fixed between said chains and having an axis parallel to said axis of said supply roller;

gear transmission means between said supply roller and one of said first pair of sprockets; and

means for rotating said supply roller in a direction of rotation such that said gear transmission means and said sprockets cause movement of said chains such that said lower runs move adjacent said bottom wall of said supply box toward said supply roller, whereby toner in said supply box is moved by said rod along said bottom wall to said supply roller and then is moved by said supply roller through said supply port and into said storage container, and such that said upper runs of said chains move away from said supply roller, whereby toner at an upper portion of said supply box is agitated by said rod moving away from said supply roller.

4,477,174

DEVELOPING DEVICE

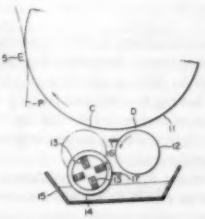
Satoshi Haneda; Makoto Tomono, and Masahiko Itaya, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 396,104

Claims priority, application Japan, Jul. 27, 1981, 56-116353

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—3 DD **28 Claims**



1. In a two-cycle electrophotographic copying apparatus comprising:

a rotatable charge retaining member;

a charging device, an exposure mechanism, a developing device and a transferring device respectively sequentially arranged about said charge retaining member in the direc-

tion of its rotation for operation during a first operation of said charge retaining member to form a toner image of an original, and for cleaning of remaining toner from said charge retaining member during a second operation of said charge retaining member to prepare said charge retaining member for a next succeeding copying operation; the improvement wherein:

said developing device comprises a first sleeve arranged adjacent said charge retaining member for developing an electrostatic latent image on the surface of said charge retaining member by means of a developer during said first operation of said charge retaining member; and

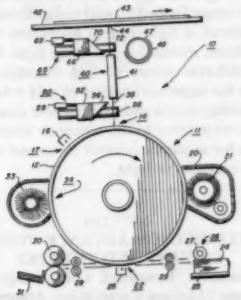
a second sleeve arranged adjacent said first sleeve, said developing device and said charge retaining member, said second sleeve supplying said developer from said developing device to said first sleeve during said first operation of said charge retaining member and said second sleeve cleaning remaining toner from the surface of said charge retaining member during said second operation of said charge retaining member.

4,477,175

MULTI-FUNCTION REPRODUCTION MACHINE

Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 20, 1982, Ser. No. 450,868
Int. Cl.³ G03G *15/04*
U.S. Cl. 355—3 R **4 Claims**



1. In a reproduction machine selectively operable in a first mode to produce copies of image originals, in a second mode to convert image originals to image signals, and in a third mode to produce copies from image signals, said reproduction machine having a xerographic system for processing images including a movable photoreceptor, means to charge the photoreceptor preparatory to imaging, an exposure station where said photoreceptor is exposed, means for developing images on said photoreceptor, means for transferring developed images from said photoreceptor to copy substrate material, and platen means for supporting image originals, the combination of:

(a) a lens array comprising a preset number of individual lens elements arrayed in at least one row, said lens elements cooperating to form at least one line-like optical path between said platen means and said photoreceptor for transmitting images from the image original on said platen means to said exposure station and said photoreceptor in said first mode;

(b) an image reading array having a plurality of image sensing elements;

(c) a first optical element selectively insertable into said optical path between said reading array and said lens array to optically couple said reading array with said lens array for transmitting images from the image original on said platen means to said reading array in said second mode;

(d) an image writing array having a plurality of individually controllable exposure elements;

(e) a second optical element selectively insertable into said optical path between said writing array and said lens array to optically couple said writing array with said lens array for transmitting images output by said writing array to said exposure station and said photoreceptor in said third mode; and

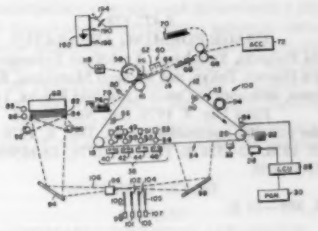
(f) control means for selectively operating said machine in one of said first, second, or third modes, said control means including means for actuating said first and second optical elements to insert the selected one of said first and second optical elements into said optical path when operating said machine in said second and third modes respectively.

4,477,176

APPARATUS FOR PRODUCING MULTIPLE IMAGE SIMPLEX AND DUPLEX COPIES IN A SINGLE PASS

Matthew J. Russel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1983, Ser. No. 566,010
Int. Cl.³ G03G *15/00, 13/16, 13/00, 15/01*
U.S. Cl. 355—3 TR **8 Claims**



1. Reproduction apparatus comprising:

a movable imaging member upon which at least first and second transferable images are carried;

transfer means for transferring said transferable images from said imaging member to a copy sheet; and

positioning means operable in synchronism with said movable imaging member and said transfer means (1) in a first mode for positioning one side of a copy sheet in transferable relationship with said movable member at said transfer means to successively transfer said first and second transferable images to said one side of said copy sheet and (2) in a second mode for positioning a copy sheet in transferable relationship with said movable member at said transfer means to successively transfer said first and second images to respective opposite sides of said copy sheet.

4,477,177

APPARATUS FOR PROJECTING A SCREEN PATTERN ONTO A PHOTOCONDUCTOR

Pierce B. Day, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 15, 1983, Ser. No. 466,401
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—11 **7 Claims**

1. Apparatus for projecting a screen pattern onto a moving photoconductor, the apparatus comprising:

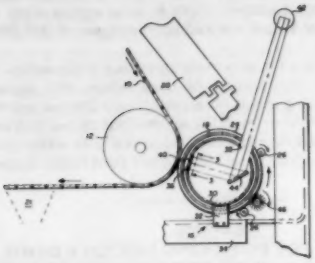
a transparent cylinder having a screen pattern thereon, a portion of the cylinder being located adjacent the photoconductor;

means for driving the cylinder in synchronism with the photoconductor;

an elongate light shield positioned inside the cylinder, the light shield having a first slot therein near the portion of

the cylinder located adjacent the photoconductor and a second slot therein spaced from the first slot;

a Fresnel lens positioned across the first slot in the light shield;



a light source located outside the cylinder; and

means for directing light from the source through the second slot, the lens and the screen pattern to project an image of the screen pattern onto the photoconductor.

4,477,178

IMAGE FORMING APPARATUS

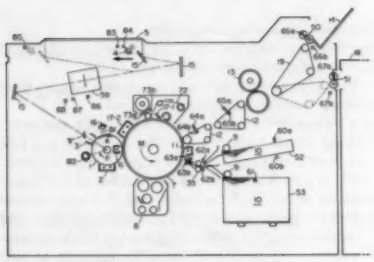
Katsushi Furuichi, Yokohama; Yoshikazu Yokomizo, Kawagoe; Toshio Honma, Tokyo, and Katsumi Murakami, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

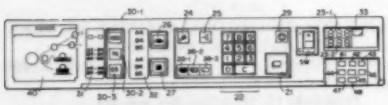
Filed Dec. 4, 1979, Ser. No. 100,236

Claims priority, application Japan, Dec. 8, 1978, 53-151775; Dec. 10, 1978, 53-152818; Dec. 29, 1978, 53-165093; Dec. 29, 1978, 53-165095

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—14 R **5 Claims**





1. An image forming apparatus comprising:

process input means for setting various data for image formation;

process means for forming images on a recording medium repeatedly in accordance with the data set by said process input means;

a plurality of ranked detection means for detecting trouble in said process means;

means for making an indication in response to a detection of trouble by said detection means; and

means for enabling a cancellation of a said indication of a low-ranked trouble without removing the cause of the detected trouble.

4,477,179

IMAGE FORMING APPARATUS WITH ADJUSTABLE LIGHT SOURCE

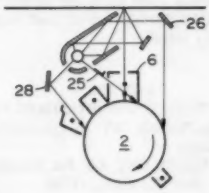
Tsuneki Inuzuka, Machida; Masato Ishida, and Yoshihiro Kawatsura, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 169,103, Jul. 15, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 428,956

Claims priority, application Japan, Jul. 16, 1979, 54-91172; Jul. 16, 1979, 54-91174; Jul. 16, 1979, 54-91176

Int. Cl.³ G03G *15/00*; G03B *27/76*

U.S. Cl. 355—14 E **19 Claims**



1. Image forming apparatus comprising a rotatable medium, means for forming an image on said rotatable medium, means to transfer the image formed by said image forming means onto a transfer material, a light source to radiate light over said rotatable medium, means for radiating light from said light source over different points of said rotatable medium, first control means for sequence control of said rotatable medium, said image forming means and said transfer means, and second control means responsive to the sequence control of said first control means for sequence control of on and off of said light source and its quantity of light.

4,477,180

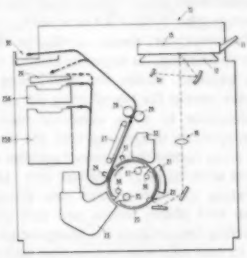
PHOTOCONDUCTOR ADVANCE SYSTEM FOR COPIERS AND THE LIKE

Louis A. Bustamante, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,205

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **13 Claims**



1. In an electrophotographic machine having a photoconductor web mounted so that a panel thereof establishes an image area for transferring images to copies, and means for advancing successive panels of said web into said image area, the improvement comprising:

means for indicating that said panel in said image area is to be replaced;

means for detecting presence of a run-out interval commencing with completion of image transfer from said image area and extending for at least the time for the last copy to exit the machine; and

means responsive to said indicating means and said detecting means for actuating said successive panel advancing means.

4,477,181

DEVICE FOR THE REPETITIVE COPYING OF ORIGINALS IN A COPIER

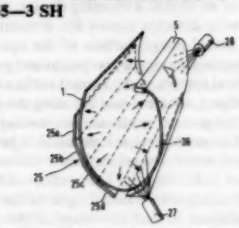
Juergen Neumann, Liederbach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

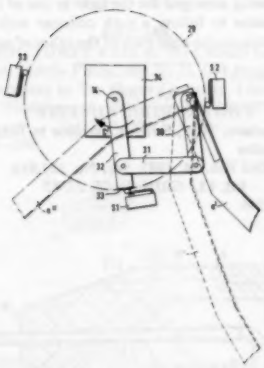
Filed Dec. 6, 1982, Ser. No. 447,214

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1981, 3149805

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—3 SH **14 Claims**





1. A device for the repetitive copying of originals in a copier, comprising:

a pivotable separating guide for the separate discharging of comparatively small orginals and comparatively large originals;

a curved supplementary guide-plate; and

means for pivoting said separating guide between a large format discharge position, a small format discharge position and a repetitive copying position, wherein, in the repetitive copying position, said separating guide forms a loop compartment with said supplementary guide-plate for receiving an original being repetitively copied.

4,477,182

PATTERN EXPOSING APPARATUS

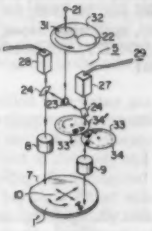
Akihiro Takanashi, Kokubunji; Norikazu Hashimoto, Hachioji; Hisashi Maejima, Higashiyamato, and Shuji Sugiyama, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 9, 1982, Ser. No. 396,880

Claims priority, application Japan, Jul. 10, 1981, 56-107003

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—43 **10 Claims**



1. A pattern exposing apparatus comprising means for projecting a semiconductor device mask pattern onto a photo-sensitive layer coated on a semiconductor substrate; optical positioning means including an optical system for pre-aligning a semiconductor substrate to be exposed next; and means for projecting an identification mark which is specific to each semiconductor substrate onto a part of said photo-sensitive layer, said identification mark projecting means being arranged to share a part of the optical system of said optical positioning means.

4,477,183

AUTOMATIC FOCUSING APPARATUS

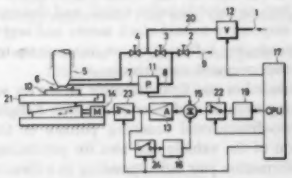
Yoshio Kawamura, Koutou; Akihiro Takanashi, Kokubunji; Toshiei Kurosaki, Edogawa; Shinji Kuniyoshi, Suginami; Sumio Hosaka, Nishitama, and Tsuneo Terasawa, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 29, 1982, Ser. No. 445,079

Claims priority, application Japan, Dec. 7, 1981, 56-181162[U]

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—55 **7 Claims**



1. An automatic focusing apparatus comprising a base on which a substrate is placed, detection means for detecting a pressure of air which is caused to flow out of an interspace between the substrate and an orifice by spurting the air from the orifice toward the substrate, reference pressure generation means for generating a reference pressure which is necessary for setting a standard distance between the substrate and the orifice, a pressure transducer which receives pressure signals from said detection means and said reference pressure generation means and which converts a pressure difference between these pressure signals into an electric signal, base drive means for moving the substrate in parallel with the orifice on the basis of the output signal from said pressure transducer, and offset signal generation means for generating an offset electrical

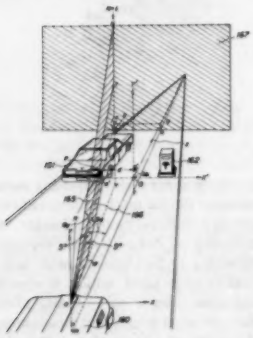
signal which, when superposed on the output electrical signal from said pressure transducer, serves to shift the substrate from the standard distance.

4,477,184

OBSTACLE DETECTION SYSTEM FOR USE IN VEHICLES

Hiroshi Endo, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 18, 1980, Ser. No. 113,263
Claims priority, application Japan, Jan. 19, 1979, 54-3928
Int. Cl.³ G01B *11/26*; G01C *3/08*; G01P *3/36*
U.S. Cl. 356—141 **48 Claims**



1. In an obstacle detection system for use in vehicles wherein decisions based upon predetermined criteria are made with respect to one or more targets existing on a course to be traveled by the vehicle in a running direction to determine whether said each target constitutes an obstacle, including: central clock means for generating high repetition rate clock pulses; pulse driver means responsive to said clock means for producing a sequence of drive pulses; laser means including a single laser responsive to said pulse drive means for emitting a sequence of laser pulses; light deflector means responsive to said clock means and said laser means for deflecting said each laser pulse in the running direction of the vehicle; transducer means responsive to each laser pulse reflected from the one or more targets for photoelectrically converting said each returned laser pulse into an electric pulse signal; and distance information means responsive to said clock means and said transducer means for producing information on distance up to said each target; the improvement comprising:

means included in said light deflector means for sequentially deflecting each of said laser pulses into a high scan density, two-dimensional scanning pattern in the running direction of the vehicle and also for producing a deflection information pair corresponding to a direction of said each laser pulse as deflected; and

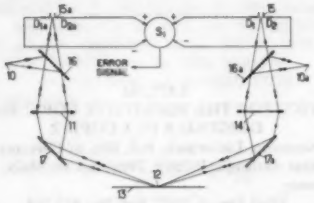
arithmetic logic means responsive to said deflection information pair for deriving directional information pair representing a direction of said each target with respect to a point where the laser pulse is transmitted, and further responsive to said directional information pair and said distance information as well as information indicative of the speed of the vehicle for deriving a running safety distance up to each target as well as for deriving a mutual distance between at least two targets and a height of each target to provide decision data on possibilities of (1) collision of the vehicle with each target, (2) passing of the vehicle through a laterally spaced target relative to travel direction of the vehicle, and (3) passing of the vehicle under a target.

4,477,185

OPTICAL IMAGING APPARATUS

Laurent Berger, and Paul Tigreat, both of Meylan, France, assignors to Euromask, Paris, France

Filed Apr. 16, 1982, Ser. No. 369,117
Claims priority, application France, Apr. 16, 1981, 81 07709
Int. Cl.³ G01B *11/26*; G01C *3/10*; G06K *7/15, 15/00*
U.S. Cl. 356—152 **6 Claims**



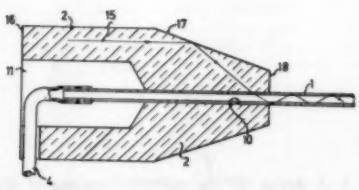
1. An imaging apparatus comprising: an optical system for forming an image of an object, a focusing device, said focusing device provided with detector means for determining deviations between an actual image surface of the optical system, said actual image surface having a predetermined position with respect to said optical system, and a second surface for forming the image of the object, wherein said focusing device includes two sets of detector means, each said set having means for focussing a spot of monochromatic light under a large angle of incidence onto said actual image surface, a differential light detector, means for collecting the light reflected by said second surface and focusing the reflected light on the differential light detector positioned so that the image of the spot is centered on the differential light detector when the actual surface and the second surface coincide and means for summing differential signals supplied by the differential light detectors of both sets, said sets being arranged for the light in one of the two sets of detector means to follow a path colinear with and in an opposite direction to the light path of the other of said two sets.

4,477,186

PHOTOMETRIC CUVETTE

Henning L. Carlson, Täby, Sweden, assignor to Bifok AB, Sollentuna, Sweden

Filed Feb. 24, 1982, Ser. No. 351,919
Int. Cl.³ G01N *21/05, 21/85*
U.S. Cl. 356—246 **16 Claims**



1. Method of optical analysis is an unobstructed flow-through cuvette wherein the medium is conducted through a hollow cuvette tube having a tubular wall of transparent material, characterized in that light essentially parallel to the longitudinal axis of the cuvette tube is directed obliquely into the tube through the tube wall adjacent one end of said tube, is reflected within said tube and travels to the other end of said tube where it is directed obliquely out through the tube wall to a detector, the angle of incidence of the light to the surface of the tube being selected so that the light is totally reflected after

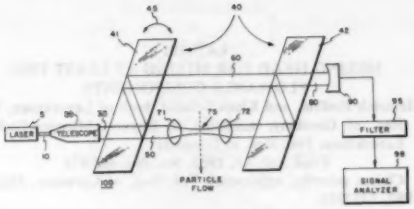
entry into the tube against the outer tube wall where said wall is in contact with the surrounding atmosphere, and that the light is supplied essentially uniformly around the circumference of the tube.

4,477,187

APPARATUS AND METHOD FOR SIZING PARTICLES

Donald R. Pettit, and Thomas W. Peterson, both of Tucson, Ariz., assignors to University Patents, Inc., Norwalk, Conn.

Filed Jan. 25, 1982, Ser. No. 342,539
Int. Cl.³ G01B *9/05*
U.S. Cl. 356—335 **19 Claims**



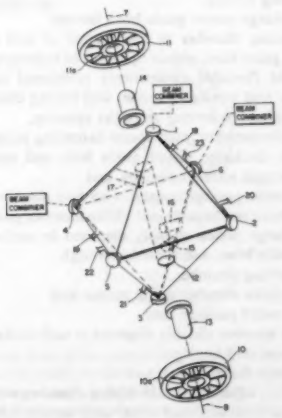
9. A method for sizing particles, comprising the steps of:
directing individual particles through an inspection region;
generating a collimated coherent beam of light;
focusing the beam at the inspection region;
gathering light from the inspection region;
producing electrical signals representative of the gathered light; and
determining, from said electrical signals, the phase shift of light scattered from an individual particle passing through the inspection region, said phase shift being indicative of the size of the particle passing through the inspection region.

4,477,188

MONOLITHIC THREE AXIS RING LASER GYROSCOPE

John C. Stiles, Morris Plains, and Bo H. G. Ljung, Wayne, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Apr. 16, 1982, Ser. No. 368,797
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **3 Claims**



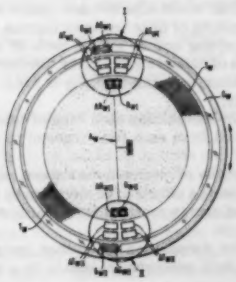
1. A monolithic ring laser gyroscope for detecting inertial rotation about first and second and third sensing axes disposed in quadrature and having a common intersection point, the gyroscope comprising:
a cube body having six faces with three axes respectively coaxial with said three sensing axes;
a plurality of mirrors with each mirror located at the center of each cube body face;
a plurality of bores formed internally of the body between each mirror and each of four adjacent mirrors thereby forming optical cavities therebetween containing lasing gas;
three mutually orthogonal planes passing through the mirrors, each plane passing through two of said sensing axes and including an optical cavity enclosing a four-sided closed beam path orthogonal to the other four-sided beam paths;
a diagonal passageway filled with lasing gas and located in the body and having a diagonal axis extending through the body of the cube and through the intersection point;
at least one cathode affixed to the body and extending outwardly from an end point of the diagonal passageway:
torsional spring means having a dither axis and being attached to the body and concentrically receiving the cathode for permitting dithering of the body about the dither axis;
a pair of anodes located in each beam path;
shortened passageways filled with lasing gas and connecting the diagonal passageway with each of the beam paths for communicating electrical energy from the cathode to the anodes; and
beam combining means optically communicating with each beam path for measuring the beat frequency between counter-rotating beams in each path, wherein said diagonal axis is disposed close to a line extending through diagonally opposite corners of said cube for ease of manufacture of the diagonal passageway, and wherein each said shortened passageway has an opening into its respective four-sided beam path, said opening and its pair of beam path anodes being disposed so that the opening is midway between the pair of beam path anodes for forming a symmetrical flow path.

4,477,189

PHOTOELECTRIC INCREMENTAL MEASURING DEVICE

Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Feb. 9, 1982, Ser. No. 347,301
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1981, 3104972
The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.
Int. Cl.³ G01D *5/245*
U.S. Cl. 356—374 **5 Claims**



1. In an incremental photoelectric measuring device for

measuring the position of a first object relative to a second object; wherein the device comprises a scale having a division grid and at least first and second reference marks spatially separated along the grid, each of the reference marks comprising a group of irregularly spaced reference lines; and wherein the device further comprises a scanning plate having at least two scanning regions, each having a plurality of scanning fields for scanning the scale including a respective reference mark scanning field, the improvement comprising:

a control track included in the scale, said control track having at least first and second spatially separated control regions having optical characteristics differing from a remaining portion of the control track;

each of said control regions positioned on the scale in association with a respective one of the reference marks, the alignment of the first control region with respect to the first reference mark differing from the alignment of the second control region with respect to the second reference mark;

at least first and second control track reading fields, each included in a respective one of the scanning regions of the scanning plate, said control track reading fields positioned with respect to the reference mark reading fields such that for each of the scanning regions simultaneous alignment between the respective reference mark reading field and one of the reference marks and between the respective control track reading field and one of the control regions is possible only with a respective one of the reference marks and the associated control region.

4,477,190

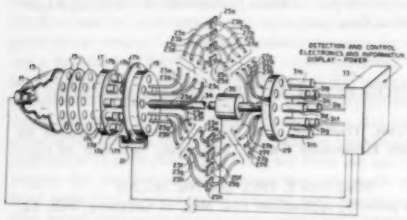
MULTICHANNEL SPECTROPHOTOMETER

Max D. Liston, Irvine; David G. Dickinson, and William A. Stark, both of Costa Mesa, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 20, 1981, Ser. No. 284,841

Int. Cl.³ G01J *3/50*

U.S. Cl. 356—418 **10 Claims**



9. A Multichannel Spectrophotometer, comprising:

a single source of radiant energy;

optical means for forming said single source into a multiplicity of beams of radiant energy;

a first filter wheel adjacent said optical means and having a multiplicity of filter segments thereon, each filter segment intercepting one at a time each of said multiplicity of beams of radiant energy as the filter wheel rotates, each of said filter segments defining a band of spectral radiant energy;

means for transmitting each band of spectral radiant energy received from each filter segment to a measurement station;

a multiplicity of measurement stations each having a cuvette containing a sample to be measured by passing the spectral radiant energy received from said first filter wheel therethrough;

means for transmitting the radiant energy output received from each measurement station to a second filter wheel; and

a second filter wheel identical to said first filter wheel each filter segment intercepting one at a time each radiant energy output from said measurement stations, said second filter wheel being rotated in aligned synchronism with said first filter wheel such that a given band of spectral radiant energy transmitted through a given filter of said first filter wheel is received and transmitted through the same filter of said second filter wheel.

4,477,191

MIXING HEAD FOR MIXING AT LEAST TWO FLOWABLE COMPONENTS

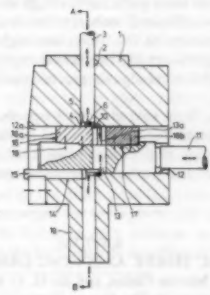
Heinrich Ersfeld, and Klaus Schulte, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 18, 1983, Ser. No. 485,975

Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3217016

Int. Cl.³ B29B *1/04*

U.S. Cl. 366—77 **10 Claims**



1. A mixing head for mixing at least two flowable components comprising:

(A) a housing having

(i) a discharge piston guide bore therein,

(ii) a mixing chamber in one section of said discharge piston guide bore, nozzle openings of injection members for said flowable components positioned equidistant around said mixing chamber, said mixing chamber further defined as having an outlet opening,

(iii) a choke member guide recess extending perpendicular to said discharge piston guide bore and transversely beyond said nozzle openings, and

(iv) an outlet passage coaxial with said discharge piston guide bore and beyond said choke member guide recess;

(B) a discharge piston slidably disposed in said discharge piston guide bore, and slidable through

(i) said mixing chamber,

(ii) said choke member guide recess, and

(iii) said outlet passage; and

(C) a choke member slidably disposed in said choke member guide recess and having

(i) a passage therethrough and

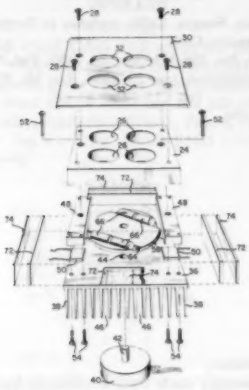
(ii) a section adjacent to said mixing chamber which has a reduced crosssectional area, said section of reduced cross-sectional area extending into said mixing chamber between said nozzle openings but leaving said nozzle openings clear.

4,477,192

MAGNETIC STIRRING APPARATUS AND METHOD

Warren J. Bonney, Yardley, Pa., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 25, 1982, Ser. No. 392,401
Int. Cl.³ B01F *13/08*
U.S. Cl. 366—274 **18 Claims**



1. Magnetic stirring apparatus for stirring the contents of a container by magnetically moving a stirrer positioned in the container, comprising subjecting means for continuously and successively subjecting the stirrer to a plurality of moving magnetic fields, said magnetic fields include at least one pair of relatively strong repelling fields and at least one pair of relatively weak repelling fields, whereby the stirrer moves erratically in the container to knead as well as stir the contents thereof.

4,477,193

TERRESTRIAL GLOBE INCLUDING A WORLD CLOCK

Shouji Yasufuku, Gifu, Japan, assignor to Unionelecs Kabushiki Kaisha, Gifu, Japan

Filed Dec. 7, 1982, Ser. No. 447,527
Claims priority, application Japan, Feb. 23, 1982, 57-27895
Int. Cl.³ G04B *19/22*
U.S. Cl. 368—24 **5 Claims**

1. A terrestrial globe comprising: a generally spherical body having on its outer surface a representation of a world map; a stand having means mounting the spherical body for manual rotational displacement about an axis of rotation relative to the stand; a plurality of energizeable illuminatable elements having illuminated and non-illuminated states and being disposed on the spherical body outer surface at points corresponding to preselected geographical regions on the world map which are located in the standard time zones of the world based on Greenwich mean time, the illuminatable elements within each standard time zone being connected together in a common group and the respective groups being angularly spaced apart around the spherical body; electric circuit means connected to the groups of illuminatable elements for energizing whichever illuminatable element group is disposed in a predetermined angular position relative to a reference point on the stand; and timekeeping means for keeping time and for displaying the local standard time corresponding to that of the standard time zone associated with the energized illuminatable element group.

4,477,194

DEVICE FOR CONTROLLING THE FUNCTIONS OF AN ELECTRONIC WATCH

Jean-Georges Michel, Neuchatel; Hubert Portmann, Rothenburg, and Ali Schneiter, Neuchatel, all of Switzerland, assignors to Ebauches, S.A., Switzerland

Filed Oct. 14, 1980, Ser. No. 196,775
Claims priority, application Switzerland, Dec. 6, 1979, 10814/79
Int. Cl.³ G04C *17/00*; G04B *19/00*
U.S. Cl. 368—69 **12 Claims**

1. A device for controlling at least one function of an electronic watch provided with a case, comprising:

at least one friction element, mounted on the watch case, having at least one ribbed zone which produces mechanical vibrations in said case when said zone is rubbed with appropriate means by the user of the watch;

an electromechanical transducer which senses said vibrations and supplies an electric signal in response thereto; and

electronic means for supplying an output signal in response to said electric signal in order to control said function of the watch.

4,477,195

ARRANGEMENT OF ANALOG-TYPE ELECTRONIC WRISTWATCH

Mitsuo Saitoh; Yasuo Kamiyama, and Mitsuhiro Murata, all of Tanashi, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Mar. 24, 1981, Ser. No. 247,038
Claims priority, application Japan, Apr. 1, 1980, 55-42110
Int. Cl.³ G04C *23/02*
U.S. Cl. 368—88 **7 Claims**

1. An analog-type electronic wristwatch structure comprising:

a main plate made of an insulating materia and having one side including a first area formed with a cutout, and second and third areas;

a wheel train bridge secured to one side of said main plate above said cutout to form therein a space;

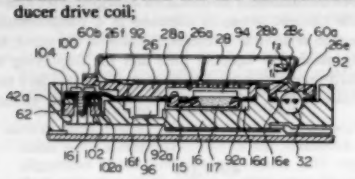
a wheel train mechanism disposed in said space;

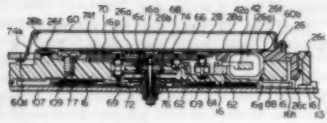
a flexible circuit board disposed in the second area of said main plate and having its lower surface facing said main plate, said lower surface being provided with a printed circuit pattern said flexible circuit board carrying elec-

tronic components composed of at least a time base vibrator and an IC chip;

an electromechanical transducer drive coil disposed in the third area of said main plate;

a flat battery disposed over said wheel train mechanism, said flexible circuit board and said electromechanical transducer drive coil;





a flat battery support member made of a synthetic resin and fixed to the one side of said main plate to support said flat battery and to press said flexible circuit board directly to said main plate in the area where said printed circuit pattern is formed; and

a battery retaining spring secured to said main plate;

said main plate and said flat battery support member having recesses for accommodating at least portions of said electronic components.

4,477,196

ANALOG ELECTRONIC TIMEPIECE

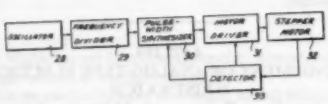
Jiro Ito, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 6, 1982, Ser. No. 375,649

Claims priority, application Japan, May 7, 1981, 56-68825; Feb. 8, 1982, 57-18644

Int. Cl.³ G04F 5/00; G04B 19/00

U.S. Cl. 368—157 **17 Claims**



1. An analog timepiece, comprising:

oscillator means for generating a periodic time standard signal;

frequency divider means for receiving and dividing the periodic time standard signal;

stepper motor means comprising rotor means, stator means and coil means, said rotor means being rotatable;

driving and control means for applying a drive signal to said stepper motor means, said driving and control means applying a drive signal to said stepper motor means that includes a first drive pulse for rotating said rotor, a second stabilizing pulse for stabilizing said rotor to affect a positioning of the rotor in one of a rotated and non-rotated position, and a third detection pulse, and detection means for detecting the positioning of said rotor in one of said rotated and non-rotated positions in response to said detection pulse, said detection means applying a non-rotation signal to said driving and control means in response to the detection of the rotor being in the non-rotated state, said driving and control means applying a fourth drive pulse to the stepper motor in response to said non-rotation signal, said fourth drive pulse affecting rotation of said rotor to said rotated position.

4,477,197

BEARING

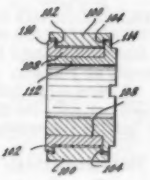
Bruce R. Choate, Saugus, Calif., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 256,083, Apr. 21, 1981, Pat. No. 4,428,689.

This application Jan. 27, 1984, Ser. No. 574,524

Int. Cl.³ F16C 33/04

U.S. Cl. 384—296 **3 Claims**



1. In combination,

a movable member made from a relatively hard material,

a bearing liner disposed on a first particular surface of the movable member in a thin layer and provided with relatively incompressible characteristics and with characteristics of resisting wear and fatigue,

a stationary member made from a relatively harder material and disposed in frictional relationship with the bearing liner, and

means disposed on the opposite side of the stationary member from the movable member for retaining the stationary member against the movable member and for inhibiting any lateral wobble between the stationary and movable members,

the stationary member being provided with a first flange at one lateral extremity and the retaining means constituting a sleeve with a second flange at the opposite lateral extremity and bearing liners being attached to one of the movable member and the first flange at the abutting position and to one of the movable member and the second flange at the abutting position.

4,477,198

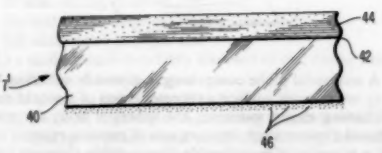
MODIFIED RESISTIVE LAYER IN THERMAL TRANSFER MEDIUM HAVING LUBRICATING CONTACT GRAPHITE COATING

Patsy A. Bowlds, Lexington; David P. Dunn, Danville; Rex D. Fathergill, Frankfort; Hugh T. Findlay, and Stafford, Donald W., both of Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 15, 1982, Ser. No. 388,554

Int. Cl.³ B41J 31/12

U.S. Cl. 400—120 **16 Claims**



1. A transfer medium having a resistive layer to receive electrical current for generation of heat, a layer of marking

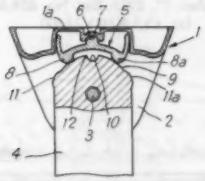
material meltable by said heat on one side of said resistive layer, and graphite powder in minute, normally unmeasurable amounts coating the surface of said resistive layer opposite said one side and adhering substantially only by inherent surface effects between said graphite and the surface of said resistive layer, said graphite coating giving a silver appearance and providing lubrication and enhanced electrical current-flow parameters.

4,477,199

DEVICE FOR INDEXING THE ARM OR CASTING OF A VEHICLE REARVIEW-MIRROR

Stephane Manzoni, 1, rue Pasteur, Saint-Claude, France (39200)

Filed Feb. 3, 1982, Ser. No. 345,301
Claims priority, application France, Feb. 6, 1981, 81 02402
Int. Cl.³ F16C *11/00*; F16D *1/12*
U.S. Cl. 403—93 **11 Claims**



1. In a device for indexing an arm supporting a rearview mirror in which one of the ends of said arm is pivotally mounted on a support member and pivots about a first pivot axis, said support member being adapted to be mounted on a motor vehicle, the improvement comprising:

a flange member formed of a resilient material and pivotally mounted on said support member, said flange member further pivoting about a second pivot axis parallel to said first pivot axis and spaced a predetermined distance therefrom;

a partial right circular cylindrical surface on said arm, said partial right circular cylindrical surface being disposed between said first and second pivot axes and curved about said first pivot axis;

a first and second abutment means extending from said flange member and each engaging said partial right circular cylindrical surface;

a recess in said arm, said recess being selectively alignable with said first abutment means in a first predetermined angular position of said arm about said first pivot axis; and

a third abutment means extending from said partial right circular cylindrical surface and selectively engageable with said second abutment means in said first predetermined angular position of said arm and in a first range of angular positions on either side of said first predetermined angular position such that said third abutment means cooperates with said second abutment means to resiliently deflect said flange member when said arm is in said first range of angular positions and pivots said first abutment means into said recess in said first predetermined angular position, said third abutment means thereby inhibiting rotation of said arm to and from said first predetermined position.

4,477,200

MULTIPLE PURPOSE PIPE CONNECTING BRACKETS

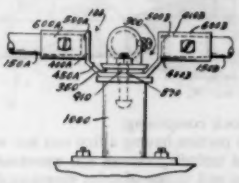
Frank J. Persichillo, 590 Sylvandale Ave., Oregon, Ohio 43616

Filed Jul. 25, 1983, Ser. No. 517,011
Int. Cl.³ F16D *1/00, 3/00*
U.S. Cl. 403—174 **2 Claims**

1. A rod interconnecting device for a frame member comprising:

(a) a U-shaped base frame member, having a flat-bottom surface, said base surface having a rectangular upper surface and said base having a first opposing edge and second opposing edge parallel to one another said respective edges being formed of the respective opposing edges of said rectangular surfaces;

(b) first and second flange members integrally connected respectively to the base member at said first and second edges respectively, said flange member being directed in a



plane which is disposed at an angle to the upper surface of said member;

(c) connecting means on said base member to interconnect said device to support means independent of said base member;

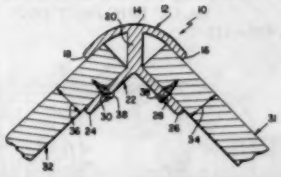
(d) rod receptacle means integrally disposed perpendecularly on each of said flange members to receive and hold the ends of rod members therein.

4,477,201

CORNER MEMBER FOR FURNITURE ASSEMBLY

Hidetoshi Yoshiyuji, Bridgewater, N.J., assignor to Takara Company, New York, Inc., Somerset, N.J.

Filed Mar. 23, 1981, Ser. No. 246,854
Int. Cl.³ F16B *9/02*
U.S. Cl. 403—231 **5 Claims**



1. An extruded corner member of the type suitable for use in attaching panels comprising:

a longitudinal outer flange comprising a central arcuate portion and a pair of straight portions each tangentially joined to one longitudinal edge of said arcuate portion;

a longitudinal web of constant width, said web being connected to a central region of said central arcuate portion; and

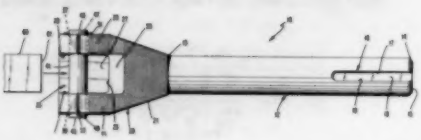
a longitudinal inner flange consisting of two longitudinal planar portions and connected to said web, said planar portions having a common boundary at said web connection, whereby each planar portion is substantially parallel to a respective opposing one of said straight portions of said outer flange member, to form pockets of substantially uniform width for receiving said panels, said pair of straight portions each having their unjoined longitudinal edge substantially opposite the midpoint of each respective opposing planar portion, said pair of longitudinal planar portions each having a longitudinal groove on the outside face thereof, for strengthening said planar portion, said groove being used to locate holes to be drilled therein.

4,477,202

PIN LOCK

John G. Price, P.O. Box 3197, Montgomery, Ala. 36109

Filed Oct. 13, 1983, Ser. No. 541,452
Int. Cl.[3] B25G *3/00*; F16D *1/00*
U.S. Cl. 403—316 12 Claims



1. A pin lock comprising:

(a) a shaft portion having a first end and a second end, said first end including connection means adapted to connect said first end to one of drive means or driven means;

(b) a receptacle portion having a first end connected to said shaft portion second end and a second end including receptacle means adapted to connect said receptacle portion second end to the other of said drive means or driven means; and

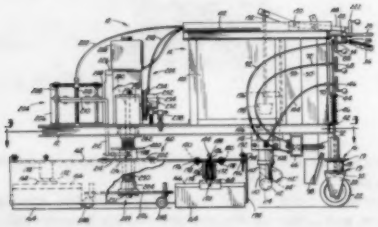
(c) pin means associated with said receptacle portion for preventing radial movement of said other of said drive means or driven means with respect to said receptacle portion, said pin means being solely engageable with peripheral portions of said other of said drive means or driven means said receptacle portion further including a substantially truncated conical region interposed between said shaft portion second end and said receptacle means.

4,477,203

APPARATUS AND METHOD FOR APPLYING COATINGS TO TRAFFIC SURFACES

Alexander Laditka, 4741 Dalebridge Rd. #C-10, Warrensville Hts., Ohio 44128

Filed Aug. 16, 1982, Ser. No. 408,484
Int. Cl.[3] E01C *19/20*, *19/21*
U.S. Cl. 404—111 20 Claims



1. A method of applying to a traffic surface a coating composition consisting of plural ingredients, wherein the method comprises the steps of:

(a) depositing a plurality of ingredients from a plurality of individual supply sources upon a traffic surface to be coated, with the deposits of ingredients being made in close proximity to each other to form a deposit mixture;

(b) bringing into contact with the deposit mixture a rotary stirring tool which includes a disk having depending blades that are arranged in an array about an axis that extends substantially normal to the traffic surface, with the stirring tool having means connecting each of the blades to the disk so that, when the disk and the blades are rotated about said axis, the blades are permitted to move a limited amount relatively toward and away from the disk, and to rock relative to the disk about axes that extend substantially parallel to the traffic surface;

(c) rotating the tool about said axis with the blades being urged into substantially continuous contact with the traffic surface and with the deposited ingredients to effect a rapid mixing of the ingredients to a condition of uniform consistency; and,

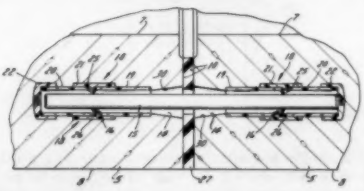
(d) applying the mixed ingredients to the traffic surface by continuing rotation of the tool about said axis, with the blades moving relative to the disk as is needed to conform their movements to the contour of the traffic surface and to substantially maintain contact with the traffic surface.

4,477,204

CAST CONCRETE ELEMENT FOR UNDERGROUND TUBULAR STRUCTURE

Clarence J. Rohde, 5167 N. Lovers La. Rd., Milwaukee, Wis. 53225, and Donald J. Farley, 2241 W. Hart Rd., Beloit, Wis. 53511, assignors to Clarence J. Rohde; Donald J. Farley; Joseph P. Selhulster, all of Waukesita, Wis. and John R. Hart, Leicestershire, England

Filed Jan. 17, 1983, Ser. No. 458,457
Int. Cl.[3] E21D *11/00*
U.S. Cl. 405—153 10 Claims



1. A cast concrete modular element cooperable with other, similiar elements to comprise a tubular underground installation such as a duct or a tunnel liner, said element having radially inner and outer faces curved concentrically to an axis that extends in opposite directions, having opposite end faces facing in said directions, and having a well opening to one of said end faces wherein a rod of a predetermined diameter is receivable for guiding said element and another similar element into a predetermined axially adjacent relationship in which said one end face opposes an end face on said other element, said modular element being characterized by means for maintaining said relationship comprising:

A. a plurality of coaxial, telescopingly connected tubular members embedded in said element, cooperating to define a portion of said well that is spaced inwardly from said one end surface and providing opposing circumferential shoulders that define between them a circumferential radially inwardly opening groove in said portion of the well,

(1) one of said tubular members having one end that defines one of said shoulders,

(2) another of said tubular members being in surrounding relation to said one tubular member and defining a radially inwardly facing surface of said groove that extends axially between said shoulders, and

(3) said tubular members having axially oppositely facing external abutment surfaces whereby they are confined against axial displacement relative to said element; and

B. an annular securement member

(1) having a radially outer marginal portion in said groove, confined between said shoulders and surrounded by said radially inwardly facing surface, and

(2) having radially inwardly projecting teeth

(a) which are resilient to be flexible away from said end surface and

(b) which, when unflexed, have radially inner edges on a circle of less than said diameter, to be flexed away from said end surface by a rod of said diameter inserted into

the well and to hold the rod against withdrawal from the well by engaging it under convergent bias.

4,477,205

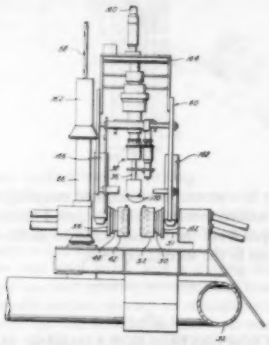
APPARATUS FOR CONNECTING UNDERWATER FLOW LINE HUBS

Charles D. Morrill, Bellaire, Tex., and Michael J. A. Best, Dursley, England, assignors to Smith International, Inc., Newport Beach, Calif.

Division of Ser. No. 098,965, Nov. 30, 1979, Pat. No. 4,371,005, which is a continuation-in-part of Ser. No. 973,895, Dec. 28, 1978, abandoned. This application Sep. 30, 1982, Ser. No. 429,532

Int. Cl.³ F16L *1/04*

U.S. Cl. 405—169 **10 Claims**



1. Apparatus for remotely connecting a pair of axially aligned underwater hubs, comprising

a connector tool,

means for lowering said connector tool through the water to a position such that said connector tool engages said hubs,

connecting means carried by said connector tool for connecting said hubs together,

a protective cover on each hub; and

means supported by said connector tool for removing said covers from said hubs in response to downward movement of said connector tool.

4,477,206

FLEXIBLE MATTRESS-LIKE ELEMENT USABLE AT BALLAST FOR IMMOBILIZING AND PROTECTING UNDERWATER PIPELINES

Andrea Papetti, and Cesare Pedrini, both of Bologna, Italy, assignors to S.P.A. Officine Maccaferri gia Raffaele Maccaferri & Figli, Bologna, Italy

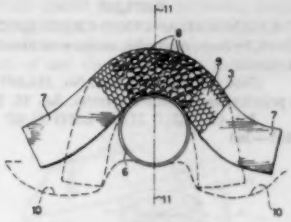
Filed Sep. 9, 1981, Ser. No. 300,529

Claims priority, application Italy, Sep. 16, 1980, 68424 A/80; Mar. 5, 1981, 52997/81[U]

Int. Cl.³ F16L *1/04*; E02B *3/12*

U.S. Cl. 405—172 **22 Claims**

1. A flexible mattress-like element usable as ballast for immobilising and protecting underwater pipelines comprising at least one gabion made from top, bottom, side and end panels of double-twist hexagonal-mesh wire netting and having an elongated flattened parallelepipied form with a longitudinal axis and a mixture disposed within said gabion constituted by an aggregate of stones or pebbles and a sand, filler, and bitumen based mastic wherein the wires forming at least said top panel of hexagonal-mesh netting of said gabion are twisted together along portions which extend traverse to said longitudinal axis



of said gabion whereby the flexibility of the element is enhanced when draped over an underwater pipeline.

4,477,207

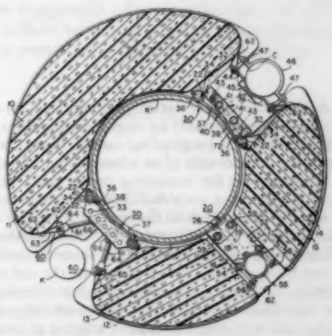
MARINE RISER BUOYANCY ASSEMBLY

Arne I. Johnson, 7400 34th St. South, Apt. 125, St. Petersburg, Fla. 33711

Filed Aug. 26, 1982, Ser. No. 411,781

Int. Cl.³ E21B *17/01*

U.S. Cl. 405—195 **11 Claims**



1. A buoyancy assembly for mounting on a riser pipe having service lines extending therealong, the assembly comprising:

(a) discontinuous clamping band means shaped to extend around the riser pipe normal to its axis and having opposed ends and having tightening means for securing said opposed ends to tighten the clamping band means on the pipe;

(b) bracket means attached to the band means opposite at least one service line, and each bracket means having walls extending outwardly from the band means including two opposed transverse walls extending in a plane normal to said axis;

(c) service line supporting means carried by at least one of said transverse walls of the bracket means and each including a supporting cradle and a clamping bar, and including securing means to tighten the bar toward the cradle;

(d) arcuate flotation modules shaped to lie against the riser pipe between the service lines, and having outer surfaces forming a contour surrounding the riser pipe; and

(e) belt means for securing the modules in the assembly, and comprising a strap overlying each module and the strap having a tension bar at each end; a link pivoted to each bracket means; and tensioning bolt means extending between the tension bars and the links and operative when

tightened to tension the strap overlying the adjacent module.

4,477,208

CHEMICAL ANCHOR CARTRIDGES

Graham Scott, Sydney, Australia, assignor to Steetley Industries Ltd., Australia

Filed Jul. 13, 1981, Ser. No. 283,097
Claims priority, application Australia, Jul. 15, 1980, PE4532
Int. Cl.³ E21D *21/00*; B65D *25/08*
U.S. Cl. 405—261 **7 Claims**

1. A chemical anchor cartridge comprising an outer envelope which is destructable by engagement with a bar or bolt and including a first longitudinal compartment for containing one or more components of an adhesive and a second longitudinal compartment for containing one or more other components of the adhesive, each end of said cartridge being adapted to be secured to a respective mating end of another cartridge to enable a plurality of said cartridges to be assembled in end-to-end relationship outside the drillhole, at least a first end of each cartridge being adapted to be retained on the end of the bar or rock bolt, said first end portion of each cartridge being of larger transverse dimension than a second end portion of the cartridge and including a concavity adapted to receive therein in mating relationship, the smaller dimensioned second end portion of another cartridge or the end of said bar or rock bolt, the first end portion of larger transverse dimension being open and adapted to receive a plug inserted therein to seat within the cartridge at a predetermined distance from said first end to form the concavity, the first and second compartments ending at a predetermined distance from said first end.

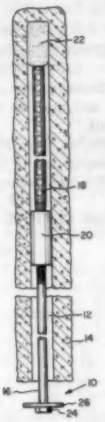
4,477,209

ANCHOR BOLT ASSEMBLY

Edward C. Hipkins, Jr., Coraopolis, and Frank M. Locotos, Bridgeville, both of Pa., assignors to H & S Machine & Supply Co., Inc., Oakdale, Pa.

Filed May 3, 1982, Ser. No. 374,515
Int. Cl.³ E21D *20/02*
U.S. Cl. 405—261 **2 Claims**

1. In an anchor bolt assembly of the type used in mine roofs and the like where the anchor bolt assembly is positioned in a drill hole of a rock formation and in which a quick-setting adhesive secures the assembly to the rock formation, said assembly including an elongated reinforcing rod, an elongated bolt and a coupling internally threaded at each end and connecting the rod and bolt, the improvement comprising a cylindrical plug of a material which is softer than the coupling, said plug extruded into frictional engagement within the internal threads of a bolt end of the coupling bore at substantially an inner end of said threads for engagement by said bolt to permit turning of the entire assembly in a first position and after approximately the application of 100 ft. lbs. of torque, to disengage from its frictional engagement to permit turning of the



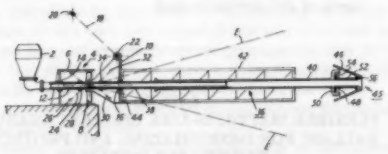
elongated bolt in a second position, said coupling including a nonthreaded section between the threaded ends, said plug being disengaged from the threads so as to locate in the nonthreaded section in the second position.

4,477,210

CONVEYOR SYSTEM FOR LOADING SHIPS

Leslie J. Yare, Tyne & Wear, England, assignor to Sendair International Limited, Washington, Great Britain

PCT No. PCT/GB82/00026, § 371 Date Sep. 23, 1982, § 102(e) Date Sep. 23, 1982, PCT Pub. No. WO82/02702, PCT Pub. Date Aug. 19, 1982
PCT Filed Jan. 29, 1982, Ser. No. 425,082
Claims priority, application United Kingdom, Jan. 31, 1981, 8103012
Int. Cl.³ B65G *53/54*
U.S. Cl. 406—166 **9 Claims**



1. A pneumatic conveyor system for transporting bulk materials from shore to ship, said system including a shore-based hopper for said material, and a sealed pipeline extending from said hopper to a receiving port in the ship, said pipeline comprising an inlet section incorporating a fixed member, a movable member mounted for universal movement relative to said fixed member, and a first length of flexible tubing having an inlet end fixed relative to said fixed member for supply with material from the hopper and an outlet end secured to said movable member, the pipeline further comprising a telescopic length of rigid tubing forming an extension of said first length of flexible tubing, and a second length of flexible tubing forming a continuation of said telescopic tubing, the outlet end of said further length of tubing being mounted for universal movement relative to the outlet end of said rigid telescopic

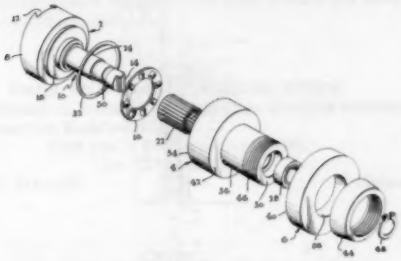
tubing and being adapted for location in the receiving port of the ship.

4,477,211

ROTARY TOOL CUTTING CARTRIDGE

Leonard A. Briese, 5039 Browndeer La., Rancho Palos Verdes, Calif. 90274

Continuation of Ser. No. 129,904, Mar. 13, 1980, abandoned.
This application Feb. 8, 1982, Ser. No. 346,948
Int. Cl.³ B23C 5/20, 5/24
U.S. Cl. 407—7 3 Claims



1. A rotary cutting tool comprising:

a tool head having mounted thereon one of more individually mounted and removable, self-contained cutting cartridges, each cutting cartridge including a stator having a base portion and a spindle portion which are adapted to be fit onto said tool head, and a cutting insert rotatably mounted on said spindle portion, said base portion and said spindle portion serving to rotatably mount said cutting insert on said tool head, said base portion having a first half of a dovetail junction, said tool head having a second half of a dovetail junction adapted to receive said base portion in either of a first or second direction, said dovetail junction on said base portion having a precut angular orientation providing said cutting insert with a preset positive rake when said stator is slip mounted on said tool head in said first direction and a preset negative rake when said stator is slip mounted on said tool head in said second direction, said spindle portion having a tongue shaped end, said tool head having a groove, said tongue shaped end of said spindle portion being seated in said groove when said cutting cartridge is mounted on said tool head said tongue and groove being in alignment with said dovetail junction and means for securing said cutting cartridge in said tool head.

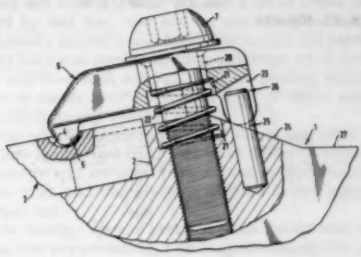
4,477,212

CUTTING TOOL

Harald Kraft, Uhingen, Fed. Rep. of Germany, assignor to Feldmühle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 31, 1982, Ser. No. 413,465
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136502
Int. Cl.³ B26D 1/00
U.S. Cl. 407—104 9 Claims

1. A cutting tool, such as a turning tool, comprising a clamping holder having a recess therein, a cutting bit insertable and securable within said recess, said cutting bit having a depression in the surface of said bit facing outwardly from said recess, a clamping shoe mounted on said clamping holder, a projecting member located on and extending outwardly from said clamping shoe so that said projecting member is arranged within said depression for securing said cutting bit on said clamping holder, means for securing said clamping shoe to said clamping holder, said means including a lifting spring for biasing said clamping shoe outwardly from said clamping holder, said clamping holder having a first surface therein containing said recess and a second surface spaced from said recess with said second surface inclined relative to said first surface, said clamping shoe having guide cams thereon disposed laterally spaced apart and spaced from said projecting member, said guide cams being engageable with the inclined said second surface on said clamping holder, means positioned on the second surface of said clamping holder and engageable between said guide cams for preventing the turning of said clamping shoe about said means securing said clamping shoe to said clamping holder, and said depression having a first surface and said projecting member having a second surface, said first and second surfaces disposed in contact when said projecting member is in engagement with said depression, and said first and second surfaces being shaped so that said projecting member is only in punctiform contact with said depression.

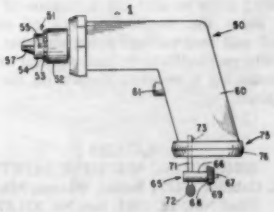


4,477,213

CHUCK KEY HOLDER FOR A POWER TOOL

James W. Nelson, Union Grove, and Steven R. Wente, Kenosha, both of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Continuation of Ser. No. 254,919, Apr. 16, 1981, abandoned.
This application Sep. 9, 1983, Ser. No. 530,614
Int. Cl.³ B23B 45/00
U.S. Cl. 408—241 R 3 Claims



1. A one-piece integral chuck key holder for removably attaching a chuck key having an elongated handle part to a power tool having a handle, said chuck key holder comprising an elastic sleeve for mounting snugly on the free end of the power tool handle, an elastic end wall, and means having an aperture therein, said means being on said sleeve and integral therewith, said aperture being adapted to receive the handle part of the chuck key and being sized for frictionally retaining same in a stored position while permitting ready removal of the chuck key for use.

4,477,214

MACHINE FOR THE PRECISION WORKING OF THE TOOTH SURFACES ON TOOTHED WORKPIECES

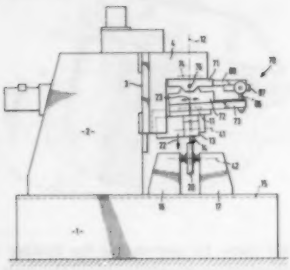
Johann Spensberger, Poing, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Fed. Rep. of Germany

Filed May 26, 1982, Ser. No. 382,327

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123502

Int. Cl.³ B23F *19/06*

U.S. Cl. 409—34 **2 Claims**



1. A machine for precision working of tooth flanks on a toothed workpiece rotatably supported in a machine frame by a rotatably supported toothed tool, comprising:

frame means;

adjusting carriage means and a swivel plate means for pivotally suspending said adjusting carriage means from said frame means and for movement about a first axis perpendicular to the axis of rotation of said workpiece, said adjusting carriage means including a guide carrier pivotally suspended by a horizontally extending bolt from said swivel plate means, a feed carriage movably mounted on said guide carrier, circular guide means for pivotally suspending said rotatably supported toothed tool from said feed carriage and for rotatable movement about a second axis perpendicular to the axis of rotation of said workpiece for purposes of achieving a crossed axes relationship between said axis of rotation of said workpiece and the axis of rotation of said tool;

first control means for effecting varying tilting of said feed carriage about the axis of said bolt; and

second control means for adjusting the angle of inclination to the horizontal of said axis of said bolt in a vertical extending plane to alter the inclination of said feed carriage about the longitudinal axis of said movement thereof, said feed carriage being movable in a direction generally perpendicular to said vertical extending plane for producing a crowned surface on the teeth of said workpiece.

4,477,215

BROACHING MACHINE SAFETY

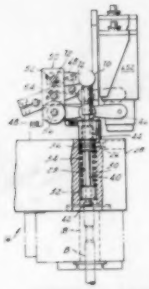
Leonard A. Gabriele, 24271 Bolam, Warren, Mich. 48089

Filed Nov. 16, 1981, Ser. No. 321,574

Int. Cl.³ B23D *41/08*

U.S. Cl. 409—245 **11 Claims**

1. A broaching machine simultaneously broaching a plurality of annular work parts comprising a work support table having a plurality of broach openings therethrough, a vertically movable broach puller below said table, a vertically movable retriever above said table having a plurality of broach holders, said retriever comprising a support bar having a plurality of vertical retriever openings therethrough in vertical alignment with said holders, an outer plunger in each of said retriever openings, resilient means in each of said openings biasing said outer plunger downwardly for actuation by a broach which fails to enter a work part, an elongated rod above said support bar, a plurality of arms fixed to said rod having portions overlying said outer plunger, a first limit switch, and a first switch operating arm fixed to said rod; each of said outer plungers having a vertical through opening, an inner plunger in each of said through openings, having its lower end engageable with the upper end of a broach in its associated holder, a second elongated rod above said support bar, a plurality of independently pivotal arms carried by said second rod, first individual resilient means urging each of said arms independently downwardly into engagement with the top



ends of said inner plungers, a third elongated rod parallel to said second rod, a plurality of rigidly interconnected arms pivotal as a unit about said third rod, a trip bar interconnecting all of said rigidly interconnected arms, each of said independently pivotal arms being engageable with said trip bar, a second limit switch, one of said rigidly interconnected arms being a second switch operating arm, second resilient means operatively connected to said second switch operating arm effective to move it to actuate said second switch, each of said first resilient means being effective to overcome said second resilient means if its independently pivotal arm is not engaged by the upper end of the inner plunger associated therewith.

4,477,216

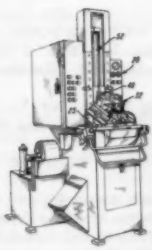
INFEED SHUTTLE TABLE FOR VERTICAL BROACH

Charles P. Van De Motter; Steven J. Hamm, and Christopher C. Van De Motter, all of Cuyahoga County, Ohio, assignors to The Ohio Broach & Machine Company, Willoughby, Ohio

Filed Jan. 26, 1982, Ser. No. 342,674

Int. Cl.³ B23D *37/12, 41/06*

U.S. Cl. 409—257 **6 Claims**



1. In a broaching machine having a base,

a ram mounted on said base for reciprocating movement in a vertical path through a downward cutting stroke and an upward return stroke,

means for mounting a broaching tool on said ram,

a table having a support plate on its upper surface adapted to

receive at least one part holding fixture thereon to hold parts in position for cutting by said tool,

means attached to the lower surface of said table forming a pivot mounting on said base for said table, said pivot mounting means including a hinge pin located on an axis under the edge of said table farthest from said ram path, and means providing for horizontal movement of said plate toward and away from said vertical path of said ram,

said plate including means for receiving the fixture in close proximity to said table, and

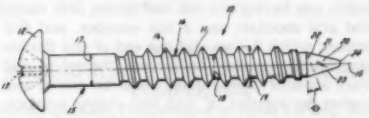
means for tilting said table between a cutting position with said plate horizontal and normal to said ram path and a loading position with said plate tilted upward and away from said ram path.

4,477,217

DRILL AND THREAD FORMING SCREW

Jerry Bonacorsi, Rockford, Ill., assignor to Rockford Products Corporation, Rockford, Ill.

Filed Jun. 1, 1981, Ser. No. 269,108
Int. Cl.³ F16B *25/00*
U.S. Cl. 411—387 **4 Claims**



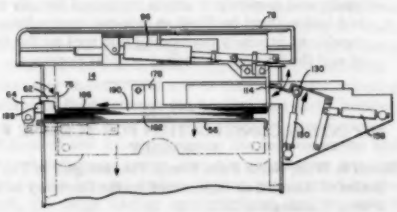
1. A drill and thread forming screw comprising: an elongated shank terminating at one end in a head and at the other end in a drill point; said shank including a threaded portion having a minor diameter and a major diameter; said drill point defining a segment of a cone having a base and a point wherein said conical segment is slightly less than one-half of the original cone and is defined by a plane parallel to and slightly beyond the longitudinal axis of the screw and also having a cutting edge and spaced therefrom an extruding edge, said cutting edge extending from said other end and terminating at said base; said base intersecting said shank at said minor diameter, wherein said screw is adapted to drill and extrude into a substrate up to said minor diameter and then to form female threads in the substrate.

4,477,218

OFFSET STACKER AND METHOD

Harley F. Bean, Grapevine, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 8, 1982, Ser. No. 355,801
Int. Cl.³ B65H *33/08*
U.S. Cl. 414—36 **15 Claims**



3. An apparatus for offset stacking sets of sheets or the like, comprising:

a support frame having an upper stacking station and a lower discharge station;

said frame having at least one fixed wall oriented substantially vertically and proximate said stacking station;

tray means having a substantially horizontal surface and positioned within said frame;

means for selectively indexing said tray means between said stacking station and said discharge station;

paper stop means having a set contacting surface;

means for selectively adjusting said stop means to a jogging position wherein it is positioned over a portion of said tray proximate said fixed wall such that said stop means may contact and hold in a fixed position a set of sheets supported by said tray, and said set contacting surface is substantially normal to said horizontal surface and parallel to said fixed wall thereby spacing a different set of sheets from said fixed wall, and to a retracted position wherein said stop means does not contact a set of sheets and is removed from said stacking station;

means for selectively patting a set of sheets supported by said tray against said fixed wall when said stop means is adjusted to said retracted position, and against said stop means when said stop means is adjusted to said jogging position; and

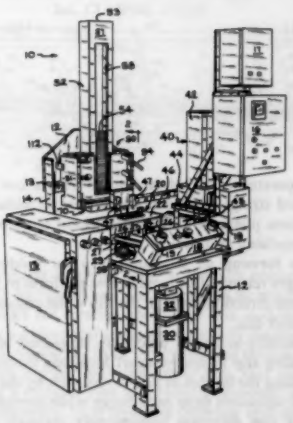
means for holding a set of sheets in place against said tray means, thereby preventing a set from moving relative to a second set superposed thereto and said tray means, said holding means including a finger plate having at least one set engaging tip, a finger plate support slidably mounted to said support frame, a link arm rotatably mounted at an end to said finger plate at an end opposite said tip, and rotatably mounted at an opposite end to said support frame, a first finger cylinder rotatably mounted at an end to said finger plate proximate said tip, and at an opposite end to said finger plate support, and a second finger cylinder rotatably mounted at an end to said link arm at an intermediate position, and rotatably mounted at an opposite end to said support frame.

4,477,219

DISPENSING APPARATUS

Charles J. Sauder, Archbold, Ohio, assignor to O.S. Equipment Inc., Archbold, Ohio

Filed Sep. 27, 1982, Ser. No. 424,377
Int. Cl.³ B65G *59/06*
U.S. Cl. 414—126 **13 Claims**



1. A dispensing apparatus for placing a generally rigid planar article onto a receiving surface in a predetermined position comprising: sleeve means for containing a stack of such articles, said sleeve means having an opening at its lower end, clamping means for engaging a portion of such stack of articles when in an engaged position, said clamping means acting to hold said stack in a stationary position in said sleeve means,

said clamping means not acting to hold the lowermost article in such stack of articles, said clamping means being movable between the engaged position and a disengaged position, said clamping means including a clamping arm, said clamping arm being pivotally mounted and positioned adjacent such stack of articles, and camming means for pivoting said clamping arm into the engaged position relative to such stack of articles, said camming means including a cam surface on said clamping arm,

jaw means for supporting such stack of articles, said jaw means being movable between open and closed positions, said jaw means when in the open position acting to allow the lowermost article in such stack to drop onto the receiving surface, and

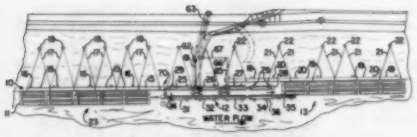
activating means for moving said clamping means between the engaged position and the disengaged position and for moving said jaw means between the open position and the closed position; said activating means including a slide member operatively connected to a cam roller engagable with such cam surface on said clamping arm, said slide member being operatively connected to said jaw means, whereby vertical movement of said slide member moves said jaw means between said open position and said closed position and moves said clamping arm between the engaged and disengaged positions.

4,477,220

METHOD AND APPARATUS FOR UNLOADING BURDEN FROM A TOW COMPRISED OF BARGES

Edward H. Greenwald, Sr., McMurray; William P. O'Malley, Pittsburgh, and Ross Rogers, Jr., Moon Township, Allegheny County, all of Pa., assignors to Eavenson, Auchmuty & Greenwald, Coraopolis, Pa.

Filed Apr. 29, 1982, Ser. No. 372,944
Int. Cl.³ B63B *27/00*; B65G *63/02*
U.S. Cl. 414—139 **10 Claims**



8. Apparatus to unload the burden from a tow comprised of breast-tied strings of barges, said apparatus including:

an access platform for removing hard ties from the barges comprising said tow,

means forming an unloading slip for guiding successive barges released from said access platform to pass normally in one direction through the slip while connected together by soft ties,

two serially-arranged unloaders supported above the unloading slip at spaced-apart locations therealong for unloading the burden in two layers each by the use of one of said unloaders from each barge while normally passing in only one direction continuously through the slip, the space between said unloaders being suffiient for substantially removing one layer of burden from one barge before removing the final second layer,

means for controlling movement of a barge along said means for forming an unloading slip, and

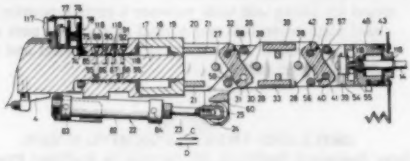
means for conveying the burden removed by said unloaders from said means forming an unloading slip.

4,477,221

ARM FOR A PROGRAMME CONTROLLED MANIPULATOR

Masahisa Sega, Tokyo, and Akira Kikuchi, Kawasaki, both of Japan, assignors to Tokico Ltd., Japan

Filed Jan. 8, 1982, Ser. No. 338,055
Claims priority, application Japan, Jan. 28, 1981, 56/11058
Int. Cl.³ B25J *9/00*
U.S. Cl. 414—735 **8 Claims**



1. A manipulator arm for a programme controlled manipulator comprising:

a base member,

a first rotary actuator supported by the base member, a flexible arm having one end, and having first, second and third arm members and a link member, said first arm member, which defines said one end of said flexible arm, being fixedly attached at one end thereof to said first rotary actuator to be rotated about an axis of said base member by rotation of said first rotary actuator, said second arm member being swingably coupled at a first portion thereof to said first arm member, said third arm member being swingably coupled to a second portion of the second arm member, said link member being swingably coupled at one end thereof to the other end of said first arm member, the other end of said link member being coupled swingably to one end of said third arm member, a straight line which connects said one end of said link member with said other end of said link member crossing a straight line which connects said first portion of said second arm member with said second portion of said second arm member,

a second rotary actuator including a stationary member fixedly mounted on a free end of said flexible arm, and a rotatable member rotatably mounted on said stationary member, in which said stationary member co-operating with said rotatable member to directly produce a rotational force for rotating said rotatable member when actuating power is supplied to said second rotary actuator,

a tool attached to said rotatable member of said second rotary actuator,

a third actuator connected to said second arm member for angularly moving said second arm member about said first protion of said second arm member relative to said first arm member,

whereby said manipulator arm is capable of directly rotating said tool without backlash so that said manipulator arm is capable of precisely positioning said tool on the free end of said flexible arm to desired angular positions.

4,477,222

MOUNTING CONSTRUCTION FOR TURBINE VANE ASSEMBLY

Daniel S. Wolf, North Palm Beach, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 30, 1982, Ser. No. 431,435
Int. Cl.³ F01D *9/04*
U.S. Cl. 415—138 **4 Claims**

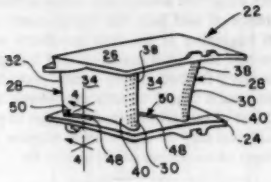
1. A turbine vane assembly of a gas turbine engine, comprises:

(a) an inner shroud wall;

(b) an outer shroud wall;

(c) at least one airfoil-shaped vane having opposite ends and extending between and rigidly connected at its opposite ends with said inner and outer shroud walls; and

(d) a recessed ledge defined in each said shroud walls along respective ones of said ends of said vane, each ledge forming a gap between said respective wall and said vane end extending from a trailing edge pressure side of said vane along said pressure side to a location approximately midway between said trailing edge and a leading edge of said pressure side of said vane.

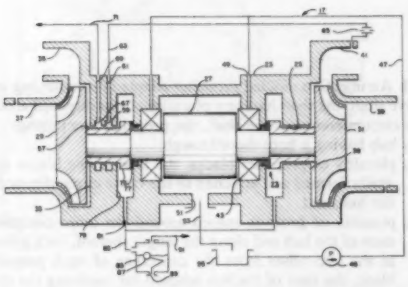


4,477,223

SEALING SYSTEM FOR A TURBOEXPANDER COMPRESSOR

Claude Giroux, Azle, Tex., assignor to Texas Turbine, Inc., Azle, Tex.

Filed Jun. 11, 1982, Ser. No. 387,504
Int. Cl.³ F01D *25/32*
U.S. Cl. 415—169 R **4 Claims**



1. In a gas processing apparatus having a housing containing a shaft with a compressor turbine in a compressor chamber on one end and an expander turbine in an expander chamber on the other end, bearing means for rotatably supporting the shaft, and pump means for circulating lubricant through the bearing means, an improved seal system comprising in combination:

chamber seal means at each end of the housing for reducing leakage of fluid between the housing and each chamber; and

a mechanical seal located between the bearing means and each chamber seal means, having a nonrotating ring carried by the housing and a rotating ring carried by the shaft, the rings having opposed faces that are biased toward and engage each other;

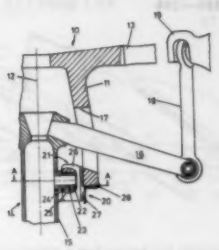
the opposed faces of the mechanical seals being in communication with a drainage chamber in the housing, the drainage chamber having drainage means for removing any lubricant leaked past the mechanical seals and any gas leaked past the seal means.

4,477,224

HELICOPTER ROTOR

Kenneth Watson, Yeovil, England, assignor to Westland plc, Yeovil, England

Filed Sep. 13, 1982, Ser. No. 417,338
Claims priority, application United Kingdom, Sep. 18, 1981, 8128362
Int. Cl.³ B64C *27/74*
U.S. Cl. 416—114 **9 Claims**



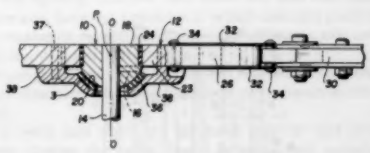
1. A helicopter rotor including a rotor hub adapted for rotation about an axis, a plurality of generally radially extending rotor blades supported on said rotor hub, pitch control means including support means comprising a universal joint located concentrically of the axis of rotation, said universal joint including three equi-spaced radially extending pins, a radially slidable and rotatable bearing having a spherical external surface on each pin, and an axially extending track for each bearing having a circular cross sectional shape for rolling engagement by the bearing, whereby said pitch control means is adapted to cause relative axial movement of the bearings in the respective tracks to achieve both collective and cyclic pitch changes of the rotor blades.

4,477,225

ELASTOMERIC UNIVERSAL ROTOR HUB

John E. Burkam, Media, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 29, 1982, Ser. No. 344,105
Int. Cl.³ B64C *27/52*
U.S. Cl. 416—134 A **11 Claims**



1. An elastomeric universal rotor hub which comprises:

an inner hub having an axis and adapted to be connected to a rotor shaft for rotation about said axis, said inner hub including a cylindrical section and radially disposed teeth extending outwardly from the cylindrical section;

an outer hub coaxial with said inner hub, said outer hub including a circular ring and radially disposed teeth extending inwardly from said ring between said inner hub teeth, respectively;

an elastomeric material interposed between said inner hub teeth and said outer hub teeth;

an annular flange connected to said inner and outer hubs; and

a further elastomeric material interposed between the annular flange and one of said inner and outer hubs, and com-

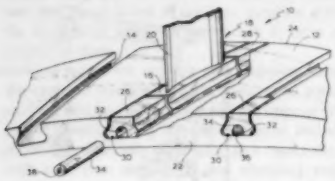
prising part of the connection of the annular flange to said inner and outer hubs.

4,477,226

BALANCE FOR ROTATING MEMBER

Diether E. Carreno, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 9, 1983, Ser. No. 492,739
Int. Cl.[3] F01D 5/10, 5/32
U.S. Cl. 416—144 21 Claims



1. Apparatus for balancing a rotating component of the type having a wheel and a plurality of blade members extending from said wheel, each of said blade members including a dovetail fittable into a dovetail slot in a perimeter of said wheel for support of said blade member, comprising:

said dovetail slot having a length exceeding a length of said dovetail;

at least one spacer fittable into said dovetail slot abutting said dovetail and effective to retain said dovetail in a predetermind longitudinal position in said dovetail slot;

a balance slot in said spacer;

said balance slot being disposed to retain sufficient strength in said spacer to permit said spacer to resist inertial forces thereon;

a balance weight fittable into said balance slot; and

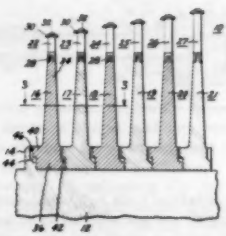
means for retaining said balance weight in said balance slot.

4,477,227

KEYING FOR SHRUNK-ON TURBINE WHEELS

Oleg Klufas, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,674
Int. Cl.[3] F01D 5/30
U.S. Cl. 416—198 A 6 Claims



1. A rotor for an axial flow elastic fluid turbine, comprising:

a shaft, centrally mounted for rotation within the turbine and having an integral circumferential flange, said flange having at least one notched keyway formed at only a discrete peripheral radial and substantially circumferential location thereon; and

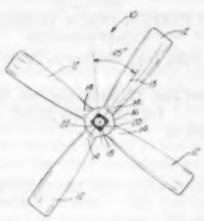
a plurality of axially spaced apart wheels, each wheel affixed to the shaft by shrink fitting for carrying turbine blading peripherally affixed to each said wheel, each said wheel including a radially outer disk portion to which said blading is affixed and a radially inner hub portion projecting axially from each side of said disk, said hub portion having at least one axially protruding key disposed at a peripheral and substantially circumferential location on said hub, said hub portion having at least one keyway axially notched into its periphery at a substantially circumferential location thereon, said key and keyway being axially oppositely disposed on opposing axial ends of said hub, said key and keyway forming a complementary formed keying means which occupies a discrete arcuate and radial extent along the circumference of said hub, the radial extent of said keying means beginning at the hub periphery and not exceeding one-half the radial extent of said hub portion, said complementary formed keying means providing for matingly keying each wheel to adjacent wheels and for keying an end one of said wheels to said flange to prevent rotation of said plurality of said wheels relative to said shaft in the event of loosening of the shrink fit.

4,477,228

INJECTION MOLDED PROPELLER

Brian J. Duffy, Derby; Eugene J. Gratz, Wichita; Steven E. Potter, Conway Springs, and Royal A. Power, Wichita, all of Kans., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 28, 1982, Ser. No. 343,556
Int. Cl.[3] B63H 1/20
U.S. Cl. 416—241 A 4 Claims



1. An injection molded propeller adapted for mounting on a drive shaft, the shaft having a plurality of ribs disposed around the circumference of the shaft, the propeller comprising:

a hub having a bore therethrough;

a plurality of propeller blades, the base of the blades integrally formed and attached to the outer circumference of the hub; and

a plurality of grooves spaced around the inner circumference of the hub and along the length thereof, each groove in the hub offset from the centerline of each propeller blade, the bore of the hub adapted for receiving the shaft therein, the ribs of the shaft indexed and received in and along the length of the grooves of the hub.

4,477,229

COMPRESSOR ASSEMBLY AND METHOD OF ATTACHING A SUCTION MUFFLER THERETO

Tadek M. Kropiwnicki, Syracuse, and Linda E. Cross, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 25, 1982, Ser. No. 411,204
Int. Cl.[3] F04B 11/00, 21/00
U.S. Cl. 417—53 9 Claims

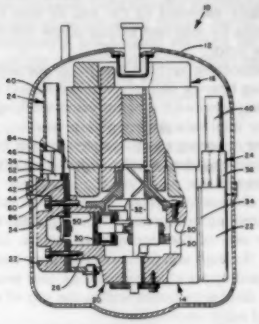
1. A compressor assembly comprising:

a central section defining a cylinder chamber;

a cylinder head secured to the central section of the compressor assembly, and defining a suction cavity and a muffler recess, the suction cavity being in communication with the cylinder chamber, and the muffler recess including a locking portion extending beneath a locking surface of the cylinder head; and

a suction muffler extending into and secured within the

muffler recess in pressure engagement with the surfaces of the cylinder head defining the muffler recess, defining a fluid flow path for conducting vapor into the suction



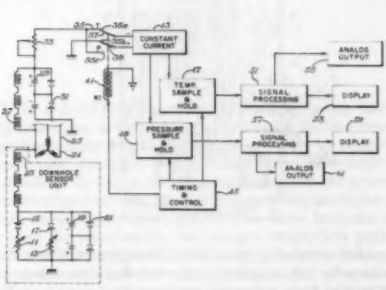
cavity, and including flange means extending into the locking portion of the muffler recess, beneath the locking surface of the cylinder head to limit movement of the suction muffler away from the cylinder head.

4,477,230

CONTINUOUS PRESSURE AND TEMPERATURE READOUT FOR SUBMERSIBLE PUMPS

Dick L. Knox, and Steven D. Roberts, both of Claremore, Okla., assignors to Hughes Tool Company, Houston, Tex.

Filed Sep. 30, 1982, Ser. No. 430,622
Int. Cl.[3] F04B *21/00*
U.S. Cl. 417—63 6 Claims



1. In a submersible pump system having power cables extending from an AC power source at the surface to a downhole motor, an improved means for measuring pressure and temperature in the environment of the motor, comprising in combination:

a pressure sensing means in the environment of the motor for providing a voltage change proportional to a change in pressure;

a temperature sensing means in the environment of the motor for providing a voltage change proportional to a change in temperature;

switch means at the surface for alternately applying to the cables a poaitive interim of positive DC potential and a negative interim of negative DC potential;

directional means for directing the positive DC potential to only one of the sensing means and for directing the negative DC potential to only the other of the sensing means;

sustaining means at the surface for sustaining during the positive interim a response received during the negative interim, and sustaining during the negative interim a response received during the positive interim; and

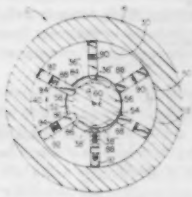
temperature compensation means for offsetting a response received when current passes through the pressure sensing means with a value corresponding to a response received when current passed through the temperature sensing means, to provide a compensated pressure indication.

4,477,231

VARIABLE DISPLACEMENT VANE TYPE PUMP

Joseph E. Swift, 47 Highview Rd., South Windsor, Conn. 06074

Filed Mar. 17, 1983, Ser. No. 476,104
Int. Cl.[3] F04B *1/06*
U.S. Cl. 417—221 17 Claims



1. A variable displacement vane type pump comprising:

a stationary structure,

a rotor supported by said stationary structure for rotation relative thereto about a horizontal rotor axis, said rotor having a cylindrical radially outwardly facing outer surface concentric with said axis and also having a right-hand end surface,

said rotor having a recess extending leftwardly from said rotor right-hand end surface which recess is defined in part by a radially inwardly facing surface generally symmetrical about said axis,

a flow modulating member having a cam portion with right and left-hand ends located in said rotor recess, said cam portion having a radially outwardly facing cylindrical cam surface, concentric about a corresponding cam portion axis, of such diameter that said cam portion fits radially loosely in said rotor recess,

means supporting said flow modulating member from said stationary structure so that said cam portion axis is parallel to said rotor axis and so that said modulating member is laterally movable relative to said stationary structure, to vary the spacing between said rotor axis and said cam portion axis, between a position at which said cam portion has a maximum eccentricity relative to said rotor axis and a position of lesser eccentricity,

means biasing said modulating member relative to said stationary structure toward said position of maximum eccentricity,

means at both said right and left-hand ends of said cam portion closing the radial space between said radially inwardly facing recess surface and said radially outwardly facing cam surface to define a fluid confining chamber between said recess surface and said cam surface,

means providing an inlet port and an outlet port in said stationary structure both communicating with said fluid confining chamber, said inlet and outlet ports being located respectively on opposite sides of the plane of movement of said cam portion axis,

a plurality of vanes carried by said rotor for radial sliding movement relative to said rotor and engageable at their inner ends with said cam surface, and

means biasing said vanes radially inwardly relative to said rotor into engagment with said cam surface,

said vanes extending axially across the full extent of said fluid confining chamber so as to divide said fluid confining chamber into a plurality of fluid confining sub-chambers which move with said rotor and which sub-chambers are

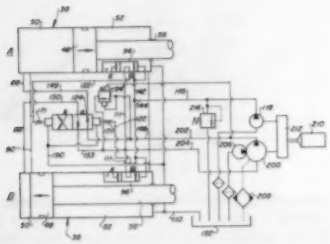
increasing in volume as they pass said inlet port and are decreasing in volume as they pass said outlet port.

4,477,232

HYDRAULICALLY ACTUATED RECIPROCATING PISTON PUMP

James R. Mayer, 7344 S. Alton Way, Englewood, Colo. 80112

Filed Jan. 10, 1983, Ser. No. 456,597
Int. Cl.³ F04B *17/00*
U.S. Cl. 417—342 **22 Claims**



1. A hydraulically actuated reciprocating piston pump comprising:

a working fluid end including a working fluid piston reciprocable in a cylinder assembly, piston rod means interconnecting said working fluid piston with a piston of a hydraulic power actuator, said actuator piston being disposed in a power actuator cylinder and dividing said actuator cylinder into first and second opposed fluid chambers, a sleeve valve disposed in one of said chambers and adapted to be shifted by said actuator piston from a first position to a second position, a source of high pressure power hydraulic fluid, a power fluid distributing valve operable in respective first and second positions to supply fluid to and vent fluid from one of said chambers, and hydraulic circuit means interconnecting said sleeve valve and said distributing valve and responsive to movement of said sleeve valve to shift said distributing valve between said positions for causing said actuator piston to drive said working fluid piston to deliver working fluid from said pump.

4,477,233

VERTICAL AXIS HERMETIC HELICAL SCREW ROTARY COMPRESSOR WITH DISCHARGE GAS OIL MIST ELIMINATOR AND DUAL TRANSFER TUBE MANIFOLD FOR SUPPLYING LIQUID REFRIGERANT AND REFRIGERANT VAPOR TO THE COMPRESSION AREA

Donald D. Schaefer, Farmington, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed Sep. 30, 1982, Ser. No. 430,218
Int. Cl.³ F04B *39/06*
U.S. Cl. 417—366 **6 Claims**

1. In a vertical axis hermetic helical screw rotary compressor comprising;

a closed, vertical axis, cylindrical outer enclosure,

an inner cylindrical casing of a diameter less than that of said outer enclosure,

means for coaxially fixedly mounting said inner cylindrical casing within said outer enclosure,

transverse wall means separating said inner cylindrical casing into upper and lower chambers,

intermeshed helical screw rotors mounted for rotation within said inner cylindrical casing intermediate of said transverse wall means about axes parallel to the vertical axis of said inner cylindrical casing,

vertical shaft means for one of said helical screw rotors coaxially fixed thereto,

an electrical motor mounted within said upper chamber and including a concentric rotor and stator, said motor rotor being fixedly mounted to the end of said vertical shaft means borne by said one helical screw rotor for driving said screw rotor,

laterally intersecting vertical axis bores formed within said inner casing bearing said intermeshed helical screw rotors and forming therewith a compressor working chamber,

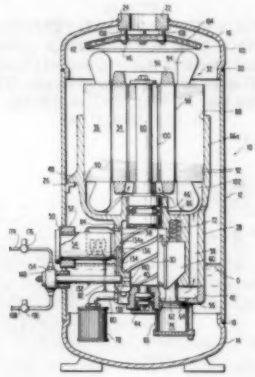
a compressor inlet tube for supplying working fluid to said compressor, opening to at least one casing bore and said compression chamber at the upper end of said helical screw rotors,

compressor discharge passage means within said inner casing for directing compressed working fluid exiting from the lower end of the intermeshed helical screw rotors, upwardly through said inner casing upper transverse wall and into said upper chamber bearing said motor means,

an axial gas discharge outlet within the top of said vertical cylindrical outer enclosure,

working fluid passage means carried by said rotor,

oil within said outer enclosure accumulating within the bottom thereof, with the lower end of said outer enclosure functioning as an oil sump, and being subject to the discharge pressure of the working fluid,



means for circulating oil to the rotating parts of said compressor for lubrication thereof, such that some lubricating oil in mist form is carried by the discharge working fluid discharging from the compression chamber and passing upwardly through said electrical drive motor towards the top of said vertical cylindrical outer enclosure,

an inverted dish type deflector fixedly mounted beneath said axial discharge outlet, spaced therefrom, and overlying the upper end of said electrical drive motor,

whereby;

oil entrained in the working fluid in mist or droplet form is partially coalesced and separated from the working fluid by centrifugal force due to rotation of the drive motor, and additional oil is separated from the working fluid by impingement of the swirling discharge gas as it is thrown upwardly from the motor rotor against the bottom surface of the deflector, such that working fluid at compressor discharge pressure substantially free of oil passes about the periphery of the deflector and exits through the axial gas discharge outlet,

the improvement comprising:

a non-woven plastic mesh pad mounted to the bottom of the deflector in the direct impact path of the discharge gas thrown vertically upwards through said electrical drive motor by rotor rotation;

whereby, said non-woven plastic mesh functions to absorb

the impact of the oil in droplet form thrown against the non-woven plastic mesh by the swirling working fluid due to motor rotor rotation to prevent the oil droplets from shattering into mist form thereby functioning as a tertiary oil separator to significantly reduce the oil content of the gas subsequently discharging through the outlet within the top of the vertical cylindrical outer enclosure to less than about 0.5 percent by weight.

4,477,234

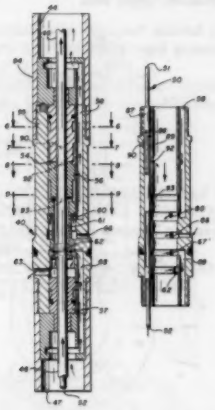
DOUBLE ACTING ENGINE AND PUMP

George K. Roeder, P.O. Box 4335, Odessa, Tex. 79760

Filed Sep. 13, 1982, Ser. No. 416,996

Int. Cl.³ F04B *47/08*

U.S. Cl. 417—393 **10 Claims**



1. In a downhole hydraulically actuated pump having an engine section, a valve section, and pump section connected together to form an elongated pump assembly by which power fluid under relatively high pressure flows downhole into a borehole to the valve section which conducts the power fluid into the engine section, thereby reciprocating an engine piston, while concurrently spent power fluid flows from the engine, through the valve section and along a return flow path to the surface of the earth; with there being a formation fluid passageway connected to the downhole pump so that when the pump is reciprocated by the engine, formation fluid is forced along said return path to the surface of the earth; said valve section is positioned intermediate an upper and lower cylinder, there being an upper and lower piston reciprocatingly received within said upper and lower cylinder, the upper piston divides the upper cylinder into a pump cylinder and an engine cylinder, while the lower piston divides the lower cylinder into a pump and engine cylinder; with the engine working chambers being adjacent the valve section and the pump working chambers being opposed to one another and located at the extremity of the pump section, and further including a production valve assembly located at each extremity of said pump section for controlling the flow of formation fluid into and out of the pump working cylinders, the improvement comprising:

a connecting rod by which said upper and lower pistons are rigidly connected to one another; said valve sections includes a valve element which is reciprocatingly shifted from one to another of two alternant positions in response to reciprocation of a control rod from one to another of two alternate positions; said control rod extends through said valve section in parallel relationship respective to said connecting rod, and includes opposed marginal ends which extend into the upper and lower engine working chambers;

said control rod is reciprocatingly positioned within the valve section to be abuttingly engaged by the confronting faces of the adjacent pistons, and thereby alternately moved from one position of operation to an alternant position of operation in response to abutting engagement with said pistons;

said cylinders, pistons, connecting rod, and valve element have a common axial centerline; the medial length of said connecting rod which extends through said valve section can be made a constant diameter to thereby provide maximum structural integrity;

said valve element is connected to receive a pressure differential thereacross in response to movement of the control rod so that the valve element shifts between the recited alternant positions of operation in response to said control rod being shifted in response to movement of the connecting rod;

passageway means by which said valve element conducts power fluid to one of the engine working chambers and conducts spent power fluid from the other of said engine working chambers, and when the pistons engage and shift the control rod, the valve element shifts to an alternant position, thereby reversing the relationship of the power fluid and spent power fluid flowing to the upper and lower engine working chambers;

and valve means at opposed ends of the pump assembly by which formation fluid flows to and production fluid flows from the pump section.

4,477,235

SUBMERGED MOTOR-PUMP UNIT

André Gilmer, Aulnay-sous-Bois; Jacques Romand-Monnier, Delle, and Jean-Pierre Lejeune, Beaucourt, all of France, assignors to Alsthom-Atlantique, Paris, France

Filed Mar. 30, 1983, Ser. No. 480,616

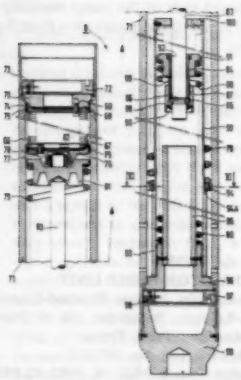
Claims priority, application France, Mar. 31, 1982, 82 05500

Int. Cl.³ F04B *17/00*; H02K *5/10, 5/12*

U.S. Cl. 417—414 **3 Claims**

1. A motor-pump unit for use submerged in a well, the motor-pump unit comprising: a motor portion, a pump portion, and a dynamic sealing system, all interconnected, the motor portion being located below the pump portion and being filled with a fluid to protect the motor portion from ingress of a medium which surrounds the motor-pump unit in use, the pump portion being connected to be driven by the motor portion so as to pump said surrounding medium, and the dynamic sealing system being located between the motor portion and the pump portion to transmit drive from the motor portion to the pump portion while preventing ingress of said surrounding medium into the motor portion, and wherein the motor portion includes a flexible compensation tank including a wall situated at the bottom thereof and in communication with said fluid in the motor portion, said flexible tank being subjected both to pressure from the surrounding medium and to a compression force exerted by resilient compression means acting between the bottom of the motor portion and said wall of the flexible tank, thereby ensuring that the fluid inside the motor portion is at a higher pressure than the surrounding medium so that any leakage through the dynamic sealing means is outwardly from the motor portion rather than inwardly, the improvement wherein said compression means includes a first spring and a second spring, means disposing said springs such that the flexible tank is subjected to the sum of their resilient

thrusts, and wherein said unit comprises release means for applying said second spring thrust and to cause said second



spring to be released and to relax once its displacement reaches a predetermined value.

4,477,236

LIQUID END STRUCTURE FOR RECIPROCATING PUMP

Robert E. Elliott, 2045 S. Holiday Hill Rd., Midland, Tex. 79703

Filed Apr. 29, 1982, Ser. No. 373,021
Int. Cl.³ F04B *21/00, 39/14*
U.S. Cl. 417—454 **9 Claims**

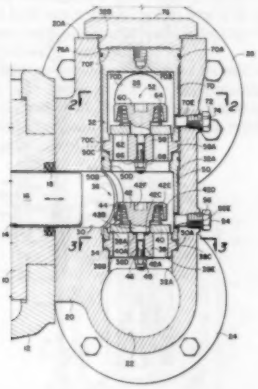
1. An improved liquid end valve structure for a reciprocating pump in which the pump has a body providing a chamber and a plunger reciprocating therein, the liquid end comprising:

a liquid end body having a lower liquid intake port, an upper exhaust port, and an intermediate plunger port between the intake and exhaust ports, the liquid end body being secured to the pump body with the plunger port in communication with the valve chamber, and the liquid end body being further defined by a vertical cylindrical valve chamber extending from the surface of the liquid end body, the cylindrical axis thereof being perpendicular the axis of the plunger, the lower end of the valve chamber communicating with said intake port, and the intermediate portion communicating with said plunger chamber, the valve chamber having a reduced internal diameter portion adjacent the lower end providing a seating ledge, the liquid end body having two spaced apart threaded alignment openings therein;

an intake valve positioned in said valve chamber in engagement with said seating ledge;

a lower tubular seat retainer of external diameter less than said valve chamber and being slidably received therein, the lower end of the lower seat retainer engaging said intake valve and serving to hold it in fixed position, the lower seat retainer having an opening in the sidewall thereof in coincidence with said plunger chamber, the upper end of the lower seat retainer forming an annular seating surface, and the lower seat retainer having an alignment opening therein spaced from said first mentioned opening;

an exhaust valve received in sealed engagement with said lower retainer upper end;



an upper tubular seat retainer of external diameter less than said valve chamber and slidably received therein, the lower end of the upper retainer engaging said exhaust valve to hold it in fixed position and having an opening in the sidewall thereof in coincidence with said outlet port, and the upper seat retainer having an alignment opening therein spaced from said first mentioned opening;

means to close the upper end of said valve chamber and to retain said upper seat retainer in secure engagement with said upper valve; and

a threaded alignment plugs received in each said liquid end alignment openings and extending into said seat retainer alignment openings to insure proper orientation of said seat retainers.

4,477,237

FABRICATED RECIPROCATING PISTON PUMP

William A. Grable, Box O, Wayne, Okla. 73095

Filed May 10, 1982, Ser. No. 376,698
Int. Cl.³ F04B *23/06*
U.S. Cl. 417—539 **22 Claims**

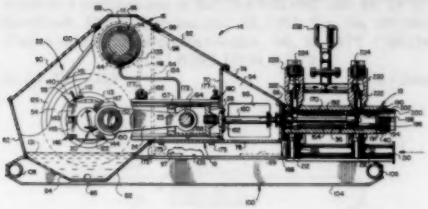
1. A fabricated reciprocating piston pump comprising:

a power end frame for supporting a rotatable eccentric shaft including at least two spaced apart eccentrics, said eccentrics being connected to respective connecting rods at one end, said connecting rods being connected at their opposite ends to respective linearly reciprocable crossheads slidably mounted on said power end frame;

a fluid end including at least two spaced apart cylinders having pistons reciprocably disposed therein and connected to respective ones of said crossheads by respective linearly reciprocable piston rods;

said power end frame including a first pair of speced apart parallel metal plate members defining the outside vertical

sidewalls of a crankcase portion and respective crosshead support portions, a second pair of parallel metal plate members spaced apart from each other and from said first pair of plate members and forming, respectively, opposite vertical sidewalls of said crosshead support portions;



means interconnecting said first and second pair of plate members to form a substantially rigid power end frame; and

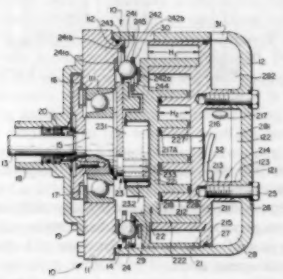
means including said second pair of plate members for support spaced apart bearings for rotatably supporting said eccentric shaft.

4,477,238

SCROLL TYPE COMPRESSOR WITH WRAP PORTIONS OF DIFFERENT AXIAL HEIGHTS

Kiyoshi Terauchi, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Feb. 23, 1983, Ser. No. 469,143
Int. Cl.³ F04C *18/02, 23/00*
U.S. Cl. 418—5 **13 Claims**



1. In a scroll type compressor including a housing having a fluid inlet port and a fluid outlet port, a fixed scroll fixedly disposed relative to said housing and having a circular end plate from which a first spiral wrap extends axially into an operative interior area of said housing, an orbiting scroll having a circular end plate from which a second spiral wrap extends axially, said first and second spiral wraps interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed-off fluid pockets within said operative interior area, a driving mechanism operatively connected to said orbiting scroll to effect orbital motion of said orbiting scroll so that the volume of the fluid pockets changes during the orbital motion of said orbiting scroll, the improvement comprising:

a transition portion on the spiral wrap of one of said scrolls, said transition portion defining an inner wrap portion extending from said transition portion toward the inner end of the spiral wrap and an outer wrap portion extending from said transition portion toward the outer end of the spiral wrap, said outer wrap portion having a greater axial height than said inner wrap portion; and

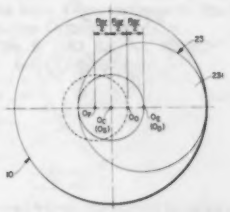
a stepped portion on the end plate of the other of said scrolls in registry with said transition portion during at least a portion of the relative orbital movement of said scrolls, said stepped portion defining an inner end plate portion extending from said stepped portion toward the center of the end plate and an outer end plate portion extending from said stepped portion toward the periphery of the end plate, said outer end plate portion being deeper than said inner end plate portion to accommodate said outer wrap portion therein.

4,477,239

SCROLL TYPE FLUID DISPLACEMENT APPARATUS WITH OFFSET WRAPS FOR REDUCED HOUSING DIAMETER

Yuji Yoshii, Shimonojo, and Masaharu Hiraga, Honjo, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Oct. 12, 1982, Ser. No. 433,896
Int. Cl.³ F01C *1/02, 17/06*
U.S. Cl. 418—55 **3 Claims**



1. In a scroll type fluid displacement apparatus including a housing, a fluid inlet port and a fluid outlet port, a fixed scroll joined with said housing and having a first circular end plate from which a first wrap extends into the interior of said housing, an orbiting scroll having a second circular end plate from which a second wrap extends, said first and second wraps interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, a driving mechanism including a drive shaft operatively connected to said orbiting scroll to effect the orbital motion of said orbiting scroll at radius Ror, and a rotation preventing means for preventing the roation of said orbiting scroll so that the volume of the fluid pockets changes during the orbital motion of said orbiting scroll, the improvement comprising the center of said first wrap being radially offset from the center of said first circular end plate by the distance ½ Ror, the center of said second wrap being radially offset from the center of said second circular end plate by the distance ½ Ror, said drive shaft having a center line aligned with the center line of said housing and, said drive shaft having a crank portion at its inner end portion operatively connected to said orbiting scroll at the center of said second end plate.

4,477,240

ROTOR BEARING LUBRICATING SYSTEM

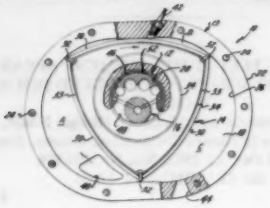
H. Russell Corwin, Montville, N.J., assignor to Deere & Company, Moline, Ill.

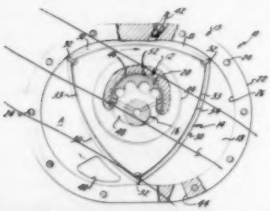
Filed Nov. 12, 1982, Ser. No. 441,079
Int. Cl.³ F01C *1/22, 21/04;* F16C *3/14*
U.S. Cl. 418—94 **3 Claims**

1. In a rotary internal combustion engine having a housing defining a multi-lobe cavity therein and a rotor of multi-sided profile supported on an eccentric portion of a rotatably driven mainshaft for planetary rotary movement in said cavity and defining with the housing cavity a plurality of working chambers which successively expand and contract in volumetric size as the rotor planetates, the eccentric portion being surrounded by a bearing carried by the rotor, a rotor bearing lubricating means for said bearing comprising:

A. a main supply passageway in said mainshaft communicating with a source of liquid lubricant under pressure;

B. an arcuate channel of at least 180°, but substantially less than 360°, in length located in the peripheral surface of said eccentric portion adjacent the inner surface of said bearing and extending substantially equally on both sides of the imaginary radial line passing through the point of the maximum throw of said eccentric; and





C. at least a pair of secondary supply passageways extending radially in said eccentric portion for communicating the main supply passage with the arcuate channel to supply liquid lubricant to the latter and for flow from the arcuate channel into the interstices between the eccentric portion of the mainshaft and said bearing.

4,477,241

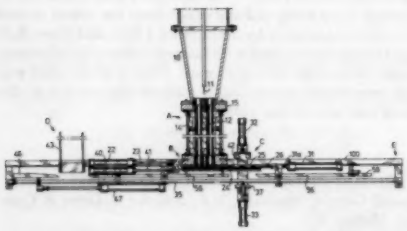
APPARATUS FOR MOLDING CURD FOR THE MANUFACTURE OF CHEESES OF SMALL SIZE

Gaston P. V. Georgel, Evron, and Marcel A. R. Guyonnet, Chaville, both of France, assignors to Fromageries Bel-La Vache Qui Rit, Paris, France

Filed Oct. 18, 1979, Ser. No. 86,062

Int. Cl.³ B29D *7/18*; B29C *1/00*

U.S. Cl. 425—85 **6 Claims**



1. An apparatus for intermittently forming multiple discrete portions of curd which comprises: means for forming columns of curds by continuous agglomeration and expulsion of whey from a plurality of vertical perforated tubes having an inlet and outlet; a hopper means for feeding a mixture of curds and whey into the inlet of each tube; curd slicing means comprising a horizontal plate in communication with the outlet of each tube which closes off the outlet, said horizontal plate being retractably mounted intermittently to permit the column of curd in each tube to drop abruptly by a predetermined height onto a subjacent stop member, and to slice the corresponding portion of curd between the outlet of the tube and the stop member; and mobile rings between said plate and said stop member through which the lower portions of columns of curd respectively drop said rings adapted to move multiple slices of curd to a transfer station aligned with the molds and means for transferring the lices to the molds.

4,477,242

BACKFLOW PREVENTER FOR AN INJECTION MOLDING MACHINE

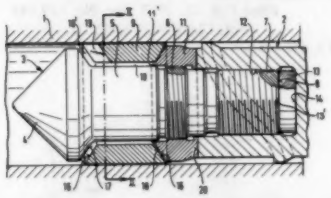
Martin Eichlseder, Tettenweis, and Erwin Bürkle, Benediktbeuern, both of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 19, 1983, Ser. No. 459,060

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1982, 3203762

Int. Cl.³ B29F *1/03, 3/02*

U.S. Cl. 425—207 **4 Claims**



1. In an injection molding machine in combination:

an injection cylinder;

a plastifying worm rotatably and axially shiftable in said cylinder to generate a liquid synthetic resin and displaces the same in said cylinder in a direction of a downstream end of said worm; and

a backflow preventer mounted on said end of said worm, said backflow preventer comprising:

a head converging in said direction and having a shank extending from said head in the opposite direction, said worm having an axial bore, said shank being threaded into said bore and bottomed on a floor thereof,

a pressure ring surrounding said shank and abutting said end of said worm around said shank with a surface of said pressure ring turned away from said head,

a blocking ring surrounding said shank and axially shiftable between said head and said pressure ring while being guided on an inner wall of said cylinder, said rings having engaging surfaces adapted to abut upon the displacement of said worm to drive synthetic resin material from said cylinder,

means forming a passage between said blocking ring and said head and effective upon separation of said surfaces to permit synthetic resin material to flow from said worm to a part of said cylinder ahead of said head,

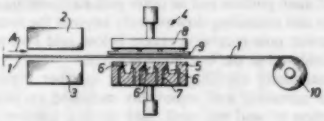
a shim received in said axial bore and defining said floor, said shim bearing upon said worm within said bore, and

a thread connection between said pressure ring and said shank.

4,477,243
THERMOFORMING APPARATUS

Hans I. Wallstén, Chemin De La LiSiére 6, CH-1018 Lausanne, Switzerland

Continuation of Ser. No. 215,839, Dec. 12, 1980, abandoned, which is a continuation of Ser. No. 920,496, Jun. 29, 1978, abandoned. This application Jun. 18, 1982, Ser. No. 389,904
Claims priority, application Sweden, Jul. 15, 1977, 7708234
Int. Cl.³ B29C *17/04, 17/10*
U.S. Cl. 425—292 **8 Claims**

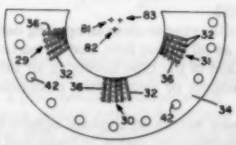


1. In apparatus for continuous vacuum forming comparatively thin-walled articles from an intermittently moved sheet of thermoplastic material in a forming station comprising stamping means having stamping blades attached thereto and projecting therefrom in the direction of said sheet with their cutting edges spaced therefrom and means for heating said blades, said stamping means being disposed on one side of the sheet and being displaceable from a rest position away from said sheet to a working position adjacent said sheet, vacuum forming means on the opposite side of said sheet and comprising at least two vacuum forming dies, each displaceable alternately and successively from a molding location in substantial registry with said sheet in the forming station to a molded article discharge location out of registry with said sheet, each said forming die having a plurality of die molds with flat coplanar surfaces substantially parallel to said sheet having formed therein mold openings facing said sheet when at said molding location, each mold opening being bounded by a resilient counter-surface wider than a stamping blade and in substantial registry therewith when the mold in which it is formed is at said molding location, said stamping means being arranged so that, when displaced to the working position and during the stamping operation, the heated blades thereof engage the sheet and press it against said counter-surfaces for stamping and severing said articles from said sheet before the dies containing the articles are displaced from the molding location to the article discharge location, and means for displacing said stamping means to the working position and for carrying out the stamping operation with very little stamping force, whereby the molded articles can be completely severed from said sheet with said very little stamping force.

4,477,244
TORCH

John R. Nis, Hamilton Township, Mercer County, and Carroll D. Spainhour, Princeton Township, Mercer County, both of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,957
Int. Cl.³ F27D *3/00*
U.S. Cl. 432—11 **14 Claims**



1. A torch, comprising:

an arcuate plate;

first and second arcuate outer members arranged such that the plate is captured therebetween;

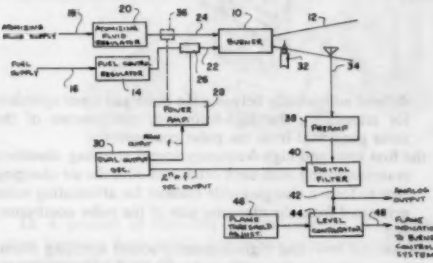
each other member having a cavity therein which opens toward the plate; and

the plate having a plurality of arcuately spaced groups of grooves on each major surface thereof extending from an outer edge thereof to the respective cavities in the outer members, each group of grooves being spaced apart from each other a distance greater than the spacing between individual grooves in each group, and all of the grooves in each group being directed towards a common line that is different than the common line associated with the other groups.

4,477,245
FLAME MONITORING SAFETY, ENERGY AND FUEL CONSERVATION SYSTEM

Joseph M. Giachino, Farmington Hills, Mich., and Marion A. Keyes, IV, Chagrin Falls, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 3, 1982, Ser. No. 414,697
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—78 **8 Claims**



1. A flame monitor for a first burner comprising:

a first oscillator for generating a signal at a characteristic frequency between 60 and 100,000 Hz;

a flame modulator connected to the first burner and to said first oscillator for modulating the flame at the characteristic frequency;

an electromagnetic signal detector associated with the first burner for sensing electromagnetic radiation from the flame;

an electronic bandpass filter connected to the detector for filtering out all but the electromagnetic signal at the characteristic frequency, which electromagnetic signal increases with increased flame temperature wherein said bandpass filter comprises a digital filter, said first oscillator having dual outputs, one for supplying a signal at the characteristic frequency to said flame modulator and the other for supplying a signal equal to $2^n \times f$ wherein n is an integer and f equals the characteristic frequency to said digital filter;

a level detector connected to said digital filter for determining the level of the electromagnetic radiation and for providing a stoichiometric combustion control function for said first burner corresponding to that level.

4,477,246
SILENCER UNIT

Satoshi Hisaoka, Fujinomiya; Takashi Matsuzaka, Fuji, and Toshihiko Saito, Yokohama, all of Japan, assignors to Suzuye and Suzuye, Kawasaki, Japan

Filed Mar. 14, 1983, Ser. No. 474,978
Claims priority, application Japan, Mar. 15, 1982, 57-40604
Int. Cl.³ F23D *15/02*
U.S. Cl. 431—114 **8 Claims**

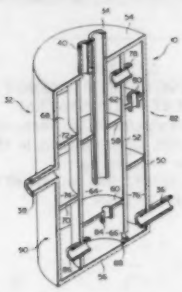
1. A silencer unit which is connected to a pulse combustor

having an air charging pipe and an exhaust pipe and attenuates noise generated from the pulse combustor, comprising:

a housing including an outer cylinder, an inner cylinder disposed in the outer cylinder, a first end plate closing one end of the outer cylinder, and a second end plate closing the other end of the outer cylinder;

first and second low-frequency sound arresting chambers defined individually in the inner cylinder for attenuating the low-frequency components of the noise generated from the pulse combustor; and

first and second high-frequency sound arresting chambers



defined individually between the outer and inner cylinders for attenuating the high-frequency components of the noise generated from the pulse combustor,

the first low- and high-frequency sound arresting chambers communicating with each other and with the air charging pipe to form a charging-side silencer for attenuating noise generated from the charging side of the pulse combustor, and

the second low- and high-frequency sound arresting chambers communicating with each other and with the exhaust pipe to form an exhaust-side silencer for attenuating noise generated from the exhaust side of the pulse combustor.

4,477,247

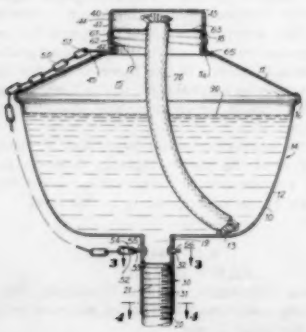
LIQUID FUEL BURNING TORCH

Haruo Kumasaka, Forest Park, Ill., assignor to Beck-Noma Illinois Inc., Forest Park, Ill.

Filed Jun. 16, 1982, Ser. No. 388,884

Int. Cl.³ F23Q *25/00*

U.S. Cl. 431—146 **4 Claims**



1. A pole-mounted, fuel-spill-resistant, outdoor torch arrangement for use in conjunction with a wick for burning liquid fuel, comprising:

a container centered on a pole defining an axis extending substantially vertically in an operating position of the arrangement, said container including

a main reservoir portion bounding a chamber for the liquid fuel and having a top and a bottom wall as considered in the operating position, said top wall having a tubular upwardly upset portion surrounding a central opening, said tubular portion of said top wall having a thread-shaped external formation thereon, and

at least one mounting portion rigid with and extending downwardly from said bottom wall of said main portion, said mounting portion having an inner part integral with said main portion and an outer part surrounding said inner part and extending downwardly beyond the same to form a lower pole-receiving recess below said bottom wall as considered in the operating position;

a substantially cup-shaped closing member separate from said container and removably mounted on said tubular portion of said top wall, said closing member having a wick-supporting portion having a central aperture of a diameter smaller than that of said central opening for the passage of the wick therethrough between said chamber and the exterior of said container, said closing member having a rim and a flange extending outwardly from said rim and frictionally engaging said top wall of said main portion around said tubular portion, said closing member having a compatibly configurated thread-shaped internal formation thereon which meshes in fuel-sealing relationship with said external formation of said tubular portion of said top wall in a fully assembled position of said closing member with respect to said container, said closing member also having an external thread-shaped connecting portion thereon;

a snuffer cap separate from said container and removably mounted on said closing member, said snuffer cap having a sealing portion which sealingly engages over and around said wick-supporting portion upon assembly thereon, said snuffer cap having a compatibly configurated internal thread-shaped connecting portion which engages said external connecting portion during and upon assembly with said closing member, said snuffer cap having an external projection having a free end portion remote from said sealing portion; and

flexible means for connecting said snuffer cap to said mounting portion of said container, said flexible means including an elongated flexible element having one end region connected to said snuffer cap at said remote free end portion, and an opposite end region connected to said mounting portion in the vicinity of said lower pole-receiving recess below said bottom wall, said flexible element extending along a course which lies between said top and bottom walls of said container upon assembly of said snuffer cap with said closing member, said flexible element being suspended vertically downwardly from said mounting portion to be located next to the pole along the entire length of the element upon disassembly of said snuffer cap with said closing member.

4,477,248

OIL BURNER SHUTTER

Robert R. Dulac, 111 Golder Rd., Lewiston, Me. 04240

Filed Aug. 4, 1983, Ser. No. 520,335

Int. Cl.³ F23D *11/36*

U.S. Cl. 431—153 **5 Claims**

1. A device of the type to close an opening defined in a boiler through which an oil burner fires, said oil burner being electrically operated and of the type having an air tube, comprising:

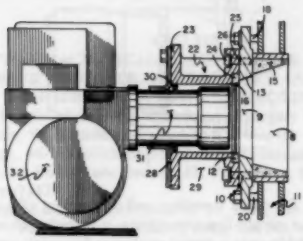
means for support of said device positioned around said opening;

a mounting base having an aperture defined therein aligned with said opening and means to retain said mounting base to said boiler by said means for support;

a mounting bracket adapted to be retained on said mounting base, said mounting bracket further having an aperture

defined therein aligned with said opening in said boiler, means to retain said oil burner in alignment with said opening in said aperture in said mounting bracket and a shutter slot horizontally defined therein adjacent to said mounting base;

a substantially rectangular shutter member adapted to be movably positioned in said shutter slot having an aperture defined in a portion thereof which in an operation mode is alignable with said opening and which in a non-operation mode is horizontally moved away from said opening which is then blocked by another portion of said shutter, said shutter adapted in its non-operation mode to seal the opening in said boiler;



means to move said shutter from said position in its operation mode to its position in its non-operation mode and vice versa;

a mounting flange attached to said mounting bracket and surrounding said oil burner's air tube to hold said oil burner in said device entirely on the opposite side of said shutter from said opening in said boiler; and

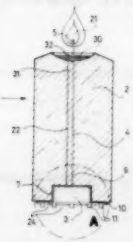
means adapted to be operated by said shutter during movement thereof at predetermined times to turn on said oil burner when said shutter is in an operation mode with said aperture aligned with said opening in said boiler and to turn off said oil burner when said shutter is in a non-operation mode with said opening in said boiler sealed by a portion of said shutter.

4,477,249

FLAME-PRODUCING SOUND-EMITTING DEVICE

Zdenka Ruzek; Pavel O. Ruzek, and Jiri Pesek, all of 181 Reserve St., Boonton, N.J. 07005

Filed Apr. 29, 1983, Ser. No. 489,793
Int. Cl.³ F23D *00/00*
U.S. Cl. 431—253 **21 Claims**



1. A sound-emitting flame-producing device, comprising

a body of combustible material which is liquid at least when heated to a predetermined temperature;

elongated wick means extending through said body and having two ends one of which extends out of said body and is permeated by a quantity of the combustible material which reacts with ambient oxygen and is replenished from said body when lit with attendant production of a flame that emits a plurality of radiation components of different wavelengths;

sound-generating means disposed at a location which is remote from said one end of said wick means and operative for generating a succession of audible sounds when activated; and

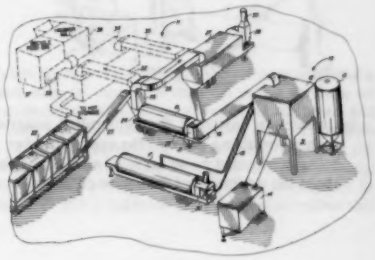
means for activating said sound-generating means upon exposure to at least one of said flame radiation components.

4,477,250

ASPHALT RECYCLE PLANT AND METHOD

David F. Brashears, Oviedo; Emanuel J. Elliott, Altamonte Springs, and Theodore G. Butler, Orlando, all of Fla., assignors to Mechtron International Corporation, Orlando, Fla.

Filed Mar. 7, 1983, Ser. No. 473,043
Int. Cl.³ F27D *1/16*; E01C *19/45*; B02C *11/08*
U.S. Cl. 432—3 **16 Claims**



12. A process of recycling asphalt materials in an asphalt plant having a dryer producing waste heated gases therefrom comprising the steps of:

breaking up old asphaltic materials;

feeding said broken up asphaltic materials to a recycle dryer;

directing heated gases from an asphalt plant asphalt dryer into said recycling dryer;

adding additional heated air to said recycling dryer from an auxiliary heat source;

heating said old asphaltic materials in said recycling dryer;

discharging gases from said recycle dryer to an exhaust system; and

feeding recycled asphalt materials from said dryer.

4,477,251

PROCESS AND APPARATUS FOR CALCINING PULVERULENT MATERIAL

Paul Cosar, Paris, and Jean-Pierre Henin, La Madeleine, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed Sep. 28, 1982, Ser. No. 425,294
Claims priority, application France, Sep. 28, 1981, 81 18195
Int. Cl.³ F27B *7/02*
U.S. Cl. 432—106 **3 Claims**

1. An apparatus for the calcination of a solid pulverulent material, which comprises the combination of

(a) a lower chamber having a bottom,

(b) a grid at the bottom of the lower chamber,

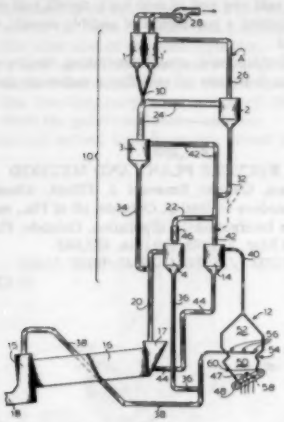
(c) means for delivering a solid fuel to the grid,

(d) means for blowing air into the lower chamber across the grid to form a fluidized bed of the solid fuel on the grid and to gasify the solid fuel whereby an ascending current of gaseous fuel is produced in the lower chamber above the fluidized bed of solid fuel,

(e) an upper chamber,

(f) a zone of reduced cross-section interconnecting the lower chamber and the upper chamber whereby said ascending

current of gaseous fuel flows from said lower chamber to said upper chamber through said zone of reduced cross-section, and



(g) means for injecting the pulverulent material together with an oxidizing gas into the upper chamber said means being constituted by an array of nozzles regularly spaced about the perimeter of the upper chamber.

4,477,252

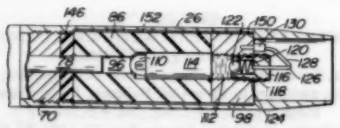
FIBER OPTIC SYSTEM FOR DENTAL HANDPIECE

Nathaniel H. Lieb, Narberth; Albert D. Alderman, Jr., Skippack, and James L. Alago, Lansdale, all of Pa., assignors to Venture Technology, Inc., West Conshohocken, Pa.

Filed Aug. 30, 1982, Ser. No. 413,021

Int. Cl.³ A61C *1/05, 3/00*

U.S. Cl. 433—29 **16 Claims**



1. In a dental handpiece comprising a hollow handle and a rotatable chuck mounted at one end thereof, the improvement comprising a fiber optic lighting system within said handle, said fiber optic lighting system comprising a plurality of light transmitting fibers, a bulb housing within said handle, said bulb housing being formed of a heat-resistant plastic having a bulb-receiving channel therein, a bulb mounted within the channel of said housing with heat-resistant plastic of said housing interposed between the bulb and the handle, said fibers having one end terminating adjacent said bulb and the other end terminating at said end of said handle, whereby light emanating from said bulb passes through said fibers and to the area adjacent said end of said handle, and whereby said heat-resistant plastic reduces heat transfer from said bulb to said handle.

4,477,253

DEVICE FOR QUICK COUPLING OF DENTAL APPLIANCE

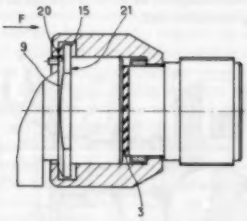
Hubert Euvrard, Geneuille, France, assignor to Micro-Mega S.A., Besancon, France

Filed Jun. 25, 1982, Ser. No. 392,000

Claims priority, application France, Jun. 30, 1981, 81 12998

Int. Cl.³ A61C *1/08*

U.S. Cl. 433—126 **3 Claims**



1. A device for quick coupling and decoupling of a dental appliance and a supply line comprising, a threaded elongated adapter threadable onto a dental appliance for quick coupling and decoupling of the dental applicance and a supply line, a collar disposed circumferentially of the adapter and having a truncated segment, a connector fitted on the supply line and having a tubular ring rotatably mounted on the connector for receiving the adapter inserted axially therein, the tubular ring having an opening and configured internally complementary to the periphery of the collar for entry of the collar internally of the tubular ring when properly aligned with said opening, the tubular ring having an internal groove for receiving the collar when the adapter is inserted into axial position in the tubular ring and the tubular ring rotated relative to the collar out of registry with said truncated segment thereof to receive it in said groove and house it therein releasably coupling the adapter and the tubular ring and said collar on said adapter having a resilient portion thereof thicker than the width of said groove thereby to releasably hold the tubular ring from rotating relative to the collar.

4,477,254

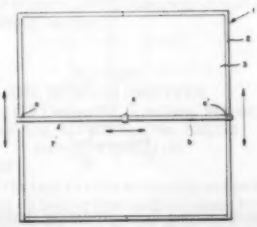
FOLDABLE MAP WITH PRESENT LOCATION INDICATOR AND PAPER REINFORCING

Kozutoyo Yokayama, 40-1 Tsukimidai, Kanagawa, Japan

Filed Dec. 17, 1982, Ser. No. 450,755

Int. Cl.³ G09B *29/10*

U.S. Cl. 434—153 **2 Claims**



1. A foldable paper map consisting of:

a sheet of paper having a map printed on at least one side thereof, said sheet of paper having a predetermined number of cuts made in upper and lower portions thereof;

a paper reinforcer provided transversely along a center line

of said sheet of paper on another side of said sheet of paper, said sheet of paper being folded with said paper reinforcer as the center line from the paper sheet's upper and lower ends and towards said center line by inwardly and outwardly folding said paper sheet into equal widths and by folding right and left ends of said paper sheet into equal widths;

a cover sheet, said folded paper sheet being attached to said cover sheet; and

a present location indicator which is slidably coupled to said cover sheet so that it slides in a vertical direction and further includes a slidable marker which is horizontally slidable on said present location indicator.

4,477,255

PHARMACEUTICALLY ACCEPTABLE SILICON RUBBER AND THERAPEUTICAL SET AND THE USE THEREOF FOR SURGICAL EMBOLIZATION

Emil Pásztor, 4, Rákóczi-u, Budapest, Hungary (1072); László Lázár, 4, Rózsahegy-u, Budapest, Hungary (1024); József Nagy, 46/b Törökbálinti-u, Budapest, Hungary (1122), and Katalin Pállosy née Becker, 31, Vincellér-u, Budapest, Hungary (1113)

Division of Ser. No. 235,084, Feb. 17, 1981, Pat. No. 4,429,062. This application Dec. 1, 1982, Ser. No. 445,691

Claims priority, application Hungary, Feb. 18, 1980, 369/80

Int. Cl.³ A61M *25/00*

U.S. Cl. 604—97 **2 Claims**

1. A therapeutic set or kit containing a silicon rubber component A composed of a linear polysiloxane, a cyclic dialkylpolysiloxane and a pharmaceutically acceptable iodo-containing organosilicium or non-metallic organic X-ray contrast material, a therapeutically acceptable cross-linking catalyst as component B, and a microcatheter.

4,477,256

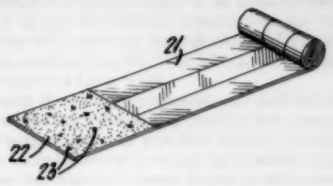
SURGICAL SPONGE

Win Hirsch, 30 Sylvia Rd., Plainview, N.Y. 11803

Continuation of Ser. No. 348,037, Feb. 11, 1982, abandoned. This application Mar. 2, 1984, Ser. No. 585,838

Int. Cl.³ A61F *13/00*

U.S. Cl. 604—362 **11 Claims**



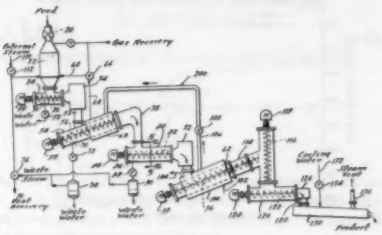
1. A surgical sponge of the blunt dissection type comprising an elongated strip of absorbent material rolled to form an essentially cylindrical roll with successive overlying layers and having an outer layer including the terminal end portion with the length of the structure being approximately equal to the width of the strip, a continuous coating of adhesive material permanently securing at least said outer layer throughout its width to said roll and a radiation opaque material within said roll.

4,477,257

APPARATUS AND PROCESS FOR THERMAL TREATMENT OF ORGANIC CARBONACEOUS MATERIALS

Edward Koppelman, Encino, and Robert G. Murray, Palo Alto, both of Calif., assignors to K-Fuel/Koppelman Patent Licensing Trust, Denver, Colo.

Filed Dec. 13, 1982, Ser. No. 449,421
Int. Cl.[3] C10F 5/00; B30B 11/00
U.S. Cl. 44—30 48 Claims



1. An apparatus for thermal treatment of moist organic carbonaceous materials containing about 25 percent to about 90 percent by weight moisture under pressure comprising

(a) means defining a preheating chamber having an inlet and an outlet spaced from said inlet,

(b) supply means for introducing a moist organic carbonaceous feed material under pressure into said inlet,

(c) means for conveying the feed material through said preheating chamber from said inlet to said outlet,

(d) means for preheating the feed material in said preheating chamber to extract water therefrom,

(e) means for separating and draining the extracted water from said preheating chamber,

(f) means defining a dewatering chamber formed with an inlet port disposed in communication with said outlet of said preheating chamber and an outlet port spaced from said inlet port,

(g) means for conveying and compacting the preheated feed material through said dewatering chamber to said outlet port to extract additional moisture therefrom, forming a dewatered feed material,

(h) means for separating and draining the extracted water from said dewatering chamber,

(i) means defining a reaction chamber formed with an entry port disposed in communication with said outlet port for receiving the dewatered feed material from said dewatering chamber and a discharge port spaced from said entry port,

(j) means for heating the feed material in said reaction chamber to an elevated temperature for a period of time sufficient to vaporize at least a portion of the volatile substances therein to form a gaseous phase and a reaction product,

(k) means for conveying the feed material through said reaction chamber and for discharging the reaction product through said discharge port,

(l) means for separating and extracting the gaseous phase from said reaction chamber, and

(m) means defining a receiving chamber disposed in communication with said discharge port for receiving the reaction product.

2. An apparatus in accordance with claim 1 wherein said moist organic carbonaceous material comprises peat, said preheating chamber comprising a reaction chamber for changing the physical characteristics of said peat introduced thereto as a result of said preheating of said peat in said preheating chamber, said means for preheating the peat feed material in said preheating chamber comprising means for preheating said peat to a temperature sufficient to cause a change in the physical characteristics of said peat which enables the moisture content of the peat conveyed through said dewatering chamber to the outlet thereof to be substantially reduced to a lower level from the level of the moisture content of the peat supplied to the inlet to said dewatering chamber.

31. A process for the thermal treatment of organic carbonaceous peat materials under pressure which comprises the steps of:

(a) introducing a supply of moist carbonaceous peat feed material to be processed under pressure into a preheating reaction chamber and preheating the peat feed material to a temperature of about 300° to about 500° F. for a period of time sufficient to cause a change in the physical characteristics of the peat feed material which enables the moisture content of the peat feed material conveyed from said preheating reaction chamber to be subsequently substantially reduced to a lower level;

(b) introducing the changed preheated peat feed material under pressure into a dewatering chamber and compacting the changed preheated peat feed material to extract sufficient water therefrom to reduce the moisture content of the peat feed material compact therein to said substantially reduced lower level;

(c) separating the dewatered peat feed material from the water;

(d) introducing the dewatered peat feed material under pressure into a reaction chamber and heating the introduced peat feed material to a temperature of about 400° to about 1200° F. under a pressure of about 300 to about 3000 psi for a period of time of about 1 minute to about 1 hour sufficient to vaporize at least a portion of the volatile substances therein to form a gaseous phase and a reaction product;

(e) separating the gaseous phase from the reaction product; and

(f) thereafter recovering and cooling the reaction product.

4,477,258

DIESEL FUEL COMPOSITIONS AND PROCESS FOR THEIR PRODUCTION

Andre O. Lepain, Rosieres-St-Andre, Belgium, assignor to Labofina, S.A., Brussels, Belgium

Filed Oct. 30, 1980, Ser. No. 202,277
Int. Cl.[3] C10L 1/32, 1/18
U.S. Cl. 44—51 10 Claims

1. Diesel fuel emulsions of the water-in-oil type comprising from about ninety-seven to about ninety volume percent of a mixture comprising a major amount of usual diesel fuel and a minor amount of at least about five volume percent, based on the volume of the emulsion, of an aqueous solution of an alcohol selected from the group consisting of methanol, ethanol, and mixtures thereof, and from about three to about ten volume percent of an emulsifying blend consisting essentially of sorbitan monooleate and a water soluble, ethoxylated, nonionic surfactant, said emulsifying blend having a hydrophilic-lipophilic balance ranging from about 5 to 7.

4,477,259

GRINDING MIXTURE AND PROCESS FOR PREPARING A SLURRY THEREFROM

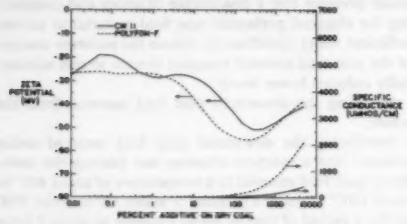
James E. Funk, Alfred Station, N.Y., assignor to Alfred University Research Foundation, Inc., Alfred, N.Y.

Continuation-in-part of Ser. No. 375,183, May 5, 1982, Pat. No. 4,441,887, which is a continuation-in-part of Ser. No. 288,737, Jul. 31, 1981, Pat. No. 4,416,666, which is a continuation-in-part of Ser. No. 88,815, Oct. 26, 1979, Pat. No. 4,282,006, which is a continuation-in-part of Ser. No. 957,166, Nov. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,337, Apr. 25, 1977, abandoned. This application Feb. 22, 1983, Ser. No. 468,459

The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.

Int. Cl.³ C10L 1/32

U.S. Cl. 44—51 **92 Claims**



1. A grinding mixture comprising from about 60 to about 82 volume percent of solid carbonaceous material, from about 18 to about 40 volume percent of carrier liquid, and from about 0.01 to about 4.0 weight percent, by weight of dry solid carbonaceous material, of dispersing agent, wherein:

(a) said grinding mixture has a pH of from about 5 to about 12,

(b) said grinding mixture contains at least two consists of solid carbonaceous material,

(c) from about 2 to about 50 weight percent of said solid carbonaceous material is comprised of carbonaceous particles with a median particle size of from about 0.05 to about 40 microns, and

(d) from about 50 to about 98 weight percent of said solid carbonaceous material is comprised of carbonaceous particles with a median particle size greater than about 40 microns.

4,477,260

PROCESS FOR PREPARING A CARBONACEOUS SLURRY

James E. Funk, Alfred Station, N.Y., assignor to Alfred University Research Foundation, Inc., Alfred, N.Y.

Continuation-in-part of Ser. No. 375,183, May 5, 1982, Pat. No. 4,441,887, which is a continuation-in-part of Ser. No. 288,737, Jul. 31, 1981, Pat. No. 4,416,666, which is a continuation-in-part of Ser. No. 088,815, Oct. 26, 1979, Pat. No. 4,282,006, which is a continuation-in-part of Ser. No. 957,166, Nov. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,337, Apr. 25, 1977, abandoned. This application Aug. 29, 1983, Ser. No. 527,277

The portion of the term of this patent subsequent to Aug. 28, 2001, has been disclaimed.

Int. Cl.³ C10L 1/32

U.S. Cl. 44—51 **19 Claims**

1. A process for preparing a carbonaceous slurry, comprising the steps of:

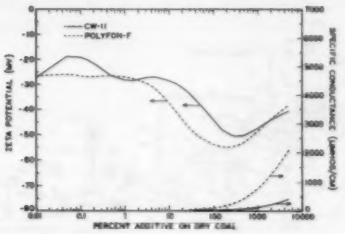
(a) providing a grinding mixture comprising from about 60 to about 82 volume percent of carbonaceous solid material and from about 18 to about 40 volume percent of carrier liquid;

(b) grinding said grinding mixture for a time sufficient to produce a carbonaceous slurry which:

1. comprises at least about 5 weight percent (by weight of said dry carbonaceous solid material) of colloidal particles of carbonaceous material which are smaller than about 3 microns;

2. comprises from about 60 to about 82 volume percent of dry carbonaceous solid material and from about 18 to about 40 volume percent of carrier liquid;

3. has a Brookfield viscosity of less than 5,000 centipoise when the slurry is tested at a solids content of 60 volume percent, a shear rate of 100 revolutions per minute, and under ambient temperature and pressure conditions;



4. has a yield stress of from about 3 to about 18 Pascals;

5. contains a consist of finely-divided carbonaceous particles dispersed in said slurry wherein said consist has a specific surface area of from about 0.8 to about 4.0 square meters per cubic centimeter and an interstitial porosity of less than 20 volume percent, and wherein said consist has a particle size distribution substantially in accordance with the following formula:

$$\frac{CPFT}{100} = \sum_{j=1}^{k} \left[X_j \left(\frac{D^{Nj} - Ds_j^{Nj}}{DL_j^{Nj} - Ds_j^{Nj}} \right) \right]$$

where $\sum_{j=1}^{k} X_j = 1.0$

and where if $D < Ds_j$ $\left(\frac{D^{Nj} - Ds_j^{Nj}}{DL_j^{Nj} - Ds_j^{Nj}} \right) = 0.0$

and where if $D > DL_j$ $\left(\frac{D^{Nj} - Ds_j^{Nj}}{DL_j^{Nj} - Ds_j^{Nj}} \right) = 1.0$

wherein:

(a) CPFT is the cumulative percent of said solid carbonaceous material finer than a certain specified particle size D, in volume percent;

(b) k is the number of component distributions in the consist and is at least 1;

(c) X_j is the fractional amount of the component j in the consist, is less than or equal to 1.0, and the sum of all of the X_j's in the consist is 1.0;

(d) n is the distribution modulus of fraction j and is greater than about 0.001;

(e) D is the diameter of any particle in the consist and ranges from about 0.05 to about 1180 microns;

(f) Ds is the diameter of the smallest particle in fraction j, as measured at 1% CPFT on a plot of CPFT versus size D, is less than D_L, and is greater than 0.05 microns;

(g) D_L is the diameter of the size modulus in fraction j, measured by sieve size or its equivalent, and is from about 15 to about 1180 microns.

(c) during the grinding of said grinding mixture, adding a total

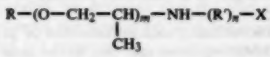
of from about 10 to about 90 weight percent of the optimum amount of dispersing agent to the grinding mixture by adding at least two separate portions of the dispersing agent at at least two separate times.

4,477,261
POLYETHER AMINO-AMIDE COMPOSITION AND MOTOR FUEL COMPOSITION CONTAINING SAME

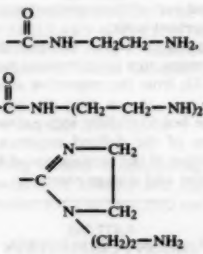
Rodney L. Sung, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 11, 1983, Ser. No. 540,588
Int. Cl.³ C10L 1/22
U.S. Cl. 44—63 **10 Claims**

1. A novel composition represented by the formula:



in which R is a hydrocarbyl radical having from 6 to 18 carbon atoms, m is an integer from 2 to 4, R′ is a divalent alkylene radical having from 2 to 3 carbon atoms, n is 1 or 2 and X is a radical from the group consistig of:

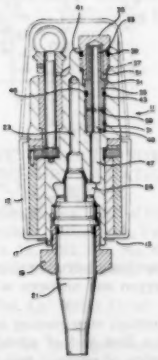


5. A motor fuel composition containing an effective carburetor detergent amount of the composition of claim 1.

4,477,262
MIXER FOR CUTTING TORCH

David A. Pryor, Denton, Tex., assignor to Victor Equipment Company, Denton, Tex.

Filed May 16, 1983, Ser. No. 494,882
Int. Cl.³ B01F 5/00
U.S. Cl. 48—180 R **4 Claims**

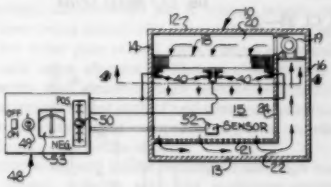


1. In a torch assembly that includes:
a. cutting oxygen valve and passageway;
b. preheat oxygen valve and passageway;
c. fuel gas valve and passageway; and
d. a head having a tip end for having a tip affixed thereto and having head passageway for cutting oxygen and a head passageway for a mixture of fuel and oxygen;
the improvement comprising:
e. an integral head mixer having within the head an incoming preheat oxygen passageway and an incoming fuel passageway and including:
i. a well into which said preheat oxygen and fuel passageways terminate at their discharge end;
ii. a mixer inserted within said well; said mixer having a seal intermediate the respective terminations of said preheat oxygen and fuel passageways so as to form separate preheat oxygen and fuel annular spaces in said well; and
iii. a holder sealingly holding said mixer within said well said head having a longitudinally extending mixture passageway for said fuel and preheat oxygen mixed together, said longitudinally extending passageway being connected with a preheat annular passageway for sealingly receiving said tip with communication between said preheat passageways therewithin; said longitudinally extending passageway being aligned with the central longitudinal axis of said well; said mixer having a substantially cylindrical, centrally disposed bore aligned with said longitudinally extending passageway of said head and having the inlet end of said bore in communication with the preheat oxygen annular space formed by said seal on said mixer, said holder and the wall of said well; said mixer having a plurality of diametrally drilled passageways penetrating laterally therethrough and communicating respectively with the fuel annular space formed by said seal on said mixer and wall of said well at the inlet end and at substantially 90° with respect to said central longitudinal axis of said well and with said bore on the discharge end, communicating at substantially 90° with respect to said bore; such that a flashback flame front extinguishes itself without sustained burning at the point of mixing of the fuel and preheat oxygen and without requiring expensive heat dissipating means.

4,477,263
APPARATUS AND METHOD FOR NEUTRALIZING STATIC ELECTRIC CHARGES IN SENSITIVE MANUFACTURING AREAS

John D. Shaver, 12 Sunrise Ct., Clover, S.C. 29710; Claude G. Adkins, P.O. Box 534, Fort Mill, S.C. 29715, and Walter Spengler, Strehlgasse 5, 4105 Biel-Benken, Switzerland

Filed Jun. 28, 1982, Ser. No. 392,531
Int. Cl.³ B03C 3/14, 3/41
U.S. Cl. 55—6 **16 Claims**



1. In a clean enclosure sized so as to be adapted to enclose a manufacturing area, means for moving an airstream along a path of travel through said enclosure, the improvement therein comprising apparatus for concurrently generating both positive and negative ions in the airstream such that the ions are able to rapidly neutralize static electricity on objects in or brought into the area, and comprising
at least one pair of electrodes operatively mounted within the path of travel of said airstream in said enclosure, with each of said at least one pair of electrodes being in the form of elongate bars which are disposed parallel to each

other, and with the electrodes of each pair being spaced apart from each other a distance of between about six to twelve inches in a direction extending transversely to the direction of the path of travel and having an intervening airspace therebetween which is free of any electrically conductive components, and each of said electrodes including a plurality of needle-like electrically conductive projections which extend toward the other electrode of the pair, and

means for supplying a positive direct current voltage to one of said electrodes of each pair, and a negative direct current voltage to the other of said electrodes of each pair, with the magnitude of the supplied voltages being sufficient to cause the electrodes to interact and cooperate in drawing ions from each other, whereby both positive and negative ions may be concurrently generated and carried through the enclosure by the moving airstream.

11. A method for delivering air to a sensitive manufacturing area, and for rapidly neutralizing static electricity on objects in or brought into the area, and comprising the steps of

moving an airstream between a cooperating pair of electrodes, with the electrodes being in the form of elongate bars which are disposed parallel to each other and spaced apart from each other a distance of between about six to twelve inches in a direction extending transversely to the direction of the airstream and having an intervening airspace therebetween which is free of any electrically conductive components, with each of said electrodes including a plurality of needle-like electrically conductive projections which extend toward the other electrode of the pair, while

supplying a positive direct current voltage to one of said electrodes and a negative direct current voltage to the other of said electrodes, with the magnitude of the supplied voltages being sufficient to cause the electrodes to interact and cooperate in drawing ions from each other, and so as to concurrently generate both positive and negative ions in the airstream, and while

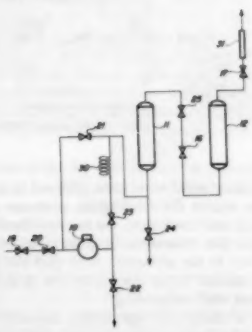
directing the airstream and entrained positive and negative ions directly to the manufacturing area and without the use of confining ductwork, to thereby minimize the loss of ions which would otherwise result from contact with such ductwork.

4,477,264

PRESSURE SWING ADSORPTION PROCESS FOR A MEDICAL OXYGEN GENERATOR FOR HOME USE

Wilbur C. Kratz, Macungie, and Shivaji Sircar, Wescosville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 30, 1983, Ser. No. 480,448
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—25 **6 Claims**



1. In the generation and recovery of high purity oxygen from an ambient air stream in a system employing a single adsorption column, the method which comprises the successive steps of:

(a) introducing pressurized air into the column containing an adsorbent bed, said bed comprising in the direction of air flow thereinto a first shallow layer of an adsorbent effective in removal of water and CO_2 followed by a predominant second layer of an adsorbent selective in sorbing nitrogen from admixture with oxygen; said bed having been brought to adsorption pressure prior to said initial air introduction with a previously obtained product stream of high oxygen concentration to bring the same form subatmospheric to slightly above atmosphere pressure;

(b) continuing said introduction of pressurized air into said bed without withdrawal of product therefrom until said bed is brought to a maximum pressure of several atmospheres;

(c) then discontinuing said introduction of pressurized air and withdrawing from said bed, in the same direction as that in which the feed air was introduced, a part of the gas product contained therein and collecting said withdrawn part in a storage reservoir;

(d) thereafter venting the bed to the atmosphere in a direction counter to air feed direction, thereby removing a portion of the contained nitrogen from said second adsorbent layer and part of the contained water and CO_2 from said first adsorbent layer;

(e) next evacuating the bed in the same direction as in the preceding venting step (d) to remove remaining nitrogen, water and CO_2 from the respective adsorbent layer; followed by,

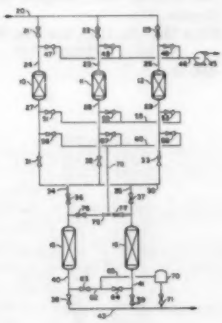
(f) restoring the bed to slightly above atmospheric pressure for repetition of the defined sequence by introducing therein a portion of the product gas of high oxygen concentration from said storage reservoir.

4,477,265

ARGON PURIFICATION

Ravi Kumar, Allentown; Shivaji Sircar, Wescosville; Thomas R. White, and Eugene J. Greskovich, both of Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 5, 1982, Ser. No. 405,643
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—26 **14 Claims**



1. The method of purifying a crude argon stream containing minor amounts of oxygen and nitrogen which comprises the steps of:

(a) during an adsorption step passing said stream as feed serially through a first bed of adsorbent preferentially selective in retention of nitrogen and during said adsorption step passing substantially the entire unadsorbed gaseous effluent from said first bed directly into and through a physically separated second adsorbent bed kinetically

selective in adsorption of oxygen, while recovering from said second bed the discharged argon product stream of enhanced purity; then regenerating both said beds by;

(b) simultaneously evacuating said first and second bed in a direction counter to step (a); then

(c) while continuing said evacuation of said first bed only, repressuring said second bed in a direction counter to that of the feed with a portion of the purified argon product recovered in step (a); then

(d) repressuring said first bed with purified nitrogen-depleted argon product from a companion first bed; then

(e) again subjecting the first bed to step (a);

the foregoing steps being carried out in preset time sequence in a system comprising a plurality of such first beds operated cyclically in parallel and a lesser plurality of such second beds operated in parallel, so arranged that the said second beds undergo in sequence, the steps of (a) receiving crude argon, (b) evacuation and (c) repressuring, a larger number of cycles during a given time period than said associated first beds.

4,477,266

SOLUTE FOCUSING TECHNIQUE FOR ON-COLUMN INJECTION IN CAPILLARY GAS CHROMATOGRAPHY

Frank J. Yang, Danville, and John V. Hinshaw, Jr., Martinez, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Sep. 15, 1983, Ser. No. 532,321
Int. Cl.³ B01D *15/08*
U.S. Cl. 55—67 **4 Claims**

1. A solute focusing method of introducing a liquid sample into a gas chromatographic column, said liquid sample comprising solute molecules and a solvent, said method comprising the steps of

providing at the inlet end of said column a first temperature controlled zone,

providing a second temperature controlled zone in said column substantially adjacent to and downstream from said first temperature controlled zone,

injecting said sample into said first temperature controlled zone when the temperature of said first temperature controlled zone is T_1, which is below the boiling point (T_B) of said solvent,

maintaining during said injection step the temperature of said second temperature controlled zone at T_3, T_3 being higher than T_B, and

increasing the temperature of said first temperature controlled zone from T_1 to T_2, T_2 being higher than T_B, and T_3 being higher than T_2.

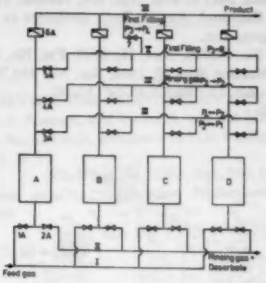
4,477,267

MOLECULAR SIEVE ZEOLITE FOR PRODUCING HYDROGEN BY PRESSURE VARIATION ADSORPTION TECHNIQUE

Gerhard Reiss, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 14, 1982, Ser. No. 434,299
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143993
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—68 **7 Claims**

1. In the increase of the hydrogen content of a gas rich in hydrogen and additionally containing CO, CH_4 and CO_2 by contacting the gas with a zeolite which selectively absorbs the gases other than hydrogen to leave the non-absorbed gas enriched in hydrogen, and then desorbing the absorbed gases from the zeolite, the improvement which comprises employing as said zeolite Ca-zeolite X granulate in which at least about



A=Adsorber Pressure Swing Apparatus (schematic)

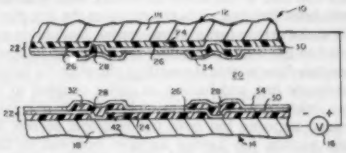
50% of the Na initially present in the zeolite has been replaced by calcium.

4,477,268

MULTI-LAYERED ELECTROSTATIC PARTICLE COLLECTOR ELECTRODES

Charles G. Kalt, 29 Hawthorne Rd., Williamstown, Mass. 01267

Division of Ser. No. 227,576, Mar. 26, 1981, Pat. No. 4,354,861.
This application Aug. 2, 1982, Ser. No. 404,307
Int. Cl.³ B03C *3/47*
U.S. Cl. 55—155 **2 Claims**



1. An electrostatic particle collector having a pair of particle collecting elements in a spaced parallel relation so as to define an air flow passage therebetween and a voltage source, one pole of said source being electrically connected to one of said elements and the other pole of said source being electrically connected to said other element so that an electric field is produced between said elements, said electrostatic particle collector characterized in that each of said elements comprises:

(a) high conductivity means comprising a planar member having a highly conductive surface;

(b) first insulative support means secured to said high conductivity means, wherein said first insulative support means comprises a planar layer of insulative material disposed over said planar member and configured, dimensioned and positioned to selectively define at least one exposed portion on said planar member;

(c) first low conductivity means electrically connected to said high conductivity means and secured to said first insulative support means, wherein said first low conductivity means is disposed over and in contact with said insulative support means and said exposed portion; and

(d) at least one insulative patch disposed over the portion of said first low conductivity means disposed over said exposed portion.

4,477,269

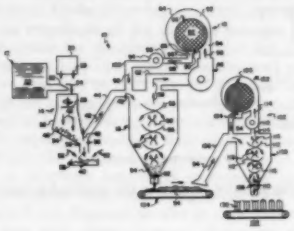
CYCLONIC SEPARATOR APPARATUS

Sidney J. Laughlin, 2411 S. 61st, Apt. H4, Temple, Tex. 76501, and Ralph J. Claypool, Austin, Tex., assignors to Sidney J. Laughlin, Rogers, Tex.

Division of Ser. No. 94,470, Nov. 15, 1979, Pat. No. 4,268,294. This application Sep. 29, 1980, Ser. No. 191,701

Int. Cl.³ B01D *46/04, 50/00*

U.S. Cl. 55—290 1 Claim



1. A cyclonic separator assembly comprising, in combination:

a vertical settling chamber for separating relatively dense fiber product from airborne lint entrained in an effluent air stream, and a filter assembly coupled to the settling chamber for extracting the entrained lint from the effluent air stream prior to discharge into the atmosphere and for reintroducing the recovered lint into the settling chamber, said filter assembly including a housing forming an air stream inlet and a lint discharge outlet, both coupled to the settling chamber, and a clean air outlet; a rotatable screen interposed between the air stream inlet and the clean air outlet whereby the entrained lint is accumulated on the screen as the effluent air stream flows through the screen and out of the clean air outlet, and whereby the accumulated lint deposit is presented to the lint discharge outlet as the screen turns; a first suction fan having an inlet coupled to the settling chamber for inducing an upwardly moving air flow within the settling chamber for entraining the airborne lint, and having an outlet coupled to the air stream inlet of said filter assembly for discharging the entrained airborne lint onto the rotatable screen; and, a second suction fan having an inlet coupled to the lint discharge outlet for creating a suction force which removes the accumulated lint deposit from the rotatable screen as it turns, and having an outlet coupled to the settling chamber of the separator assembly for discharging the suctioned lint deposit into the settling chamber.

4,477,270

AIR FILTER

Franz Tauch, 536 E. Dundee Rd., Palatine, Ill. 60067

Filed Jan. 7, 1983, Ser. No. 432,347

Int. Cl.³ B01D *50/00*

U.S. Cl. 55—316 8 Claims

1. A filter for purifying air having a plurality of filter stages comprising:

(a) a frame means having an open center core having opposite open ends,

(b) means for sealing one of said open ends of said center core,

(c) cage means mounted on said frame within said center core for holding a granular filter material,

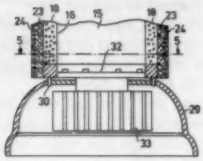
(d) a granular filter material contained within said cage means,

(e) a first filter blanket, wrapped around the exterior of said cage means and having a pre-determined density,

(f) a second filter blanket having a lesser density covering said first filter blanket,

(g) an air diffuser mounted on said frame at its remaining open end and having communication with said center core, and

(h) an air evacuating means within said air diffuser for evacuating air from within said center core through said open end of said frame means so as to create a vacuum within said center core which will be filled by filtered air drawn through said filter elements through a 360° plane.



4,477,271

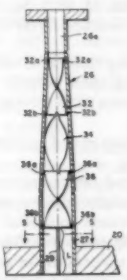
MODIFIED NOZZLES FOR POLYMER FINISHERS

John M Iwasyk, Wilmington, and Robert D. Sauerbrunn, Seaford, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 283,845, Jul. 17, 1981, abandoned. This application May 9, 1983, Ser. No. 492,744

Int. Cl.³ B01D *45/08*

U.S. Cl. 55—416 12 Claims



1. In an apparatus for separating entrained matter from a flowing fluid carrying the entrained matter that includes a continuous impervious wall forming a passage through which the entrained matter along with the fluid passes, said passage having an inlet end and an outlet end and at least one helical flight having the same twist direction throughout located in and extending longitudinally of said passage, the improvement comprising: said passage diverging from said inlet to said outlet at an angle of from about 3 degrees to about 20 degrees, said helical flight being tapered to conform to the divergence of said passage; and a straight cylindrical pipe attached to the outlet end of said passage, said pipe having a diameter equal to the diameter of the outlet end of said passage, said pipe containing a straight baffle element interlocking with the helical flight and oriented about 90 degrees thereto.

4,477,272

FAN FILTER

Craig E. Hollis, 3520 Cleveland Hghts. Blvd., 115, Lakeland, Fla. 33803, and Glenn E. Hollis, 3621 Belcher Dr., Tampa, Fla. 33609

Filed Jul. 6, 1982, Ser. No. 395,679

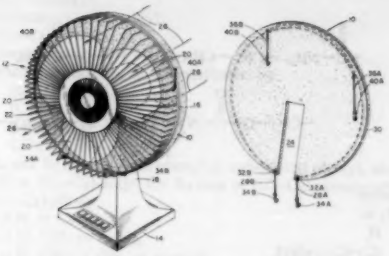
Int. Cl.³ B01D *46/10*

U.S. Cl. 55—471 3 Claims

1. In a fan of the type having fan blades rotatively driven by

a motor and a protective cage surrounding the fan blades, the improvement comprising:

a sheet of filter material having a configuration similar to that of said cage and being mounted about said cage and motor on the intake side of said fan, said sheet having a slot extending from its outer periphery so as to permit said sheet to be inserted about said motor; and means for securing said sheet about the periphery of said cage, said securing means including a first drawstring disposed about a portion of the outer periphery of said sheet, a second drawstring disposed about at least another portion of the outer periphery of said sheet and a hook connected to the ends of each drawstring to permit said ends to be connected to a bar of said cage.



4,477,273

METHOD OF AND APPARATUS FOR STRAIGHTENING AND CONFIGURING A PREFORM TUBE FROM WHICH LIGHTGUIDE FIBER IS DRAWN

Brian Lynch, Norcross, and Fred P. Partus, Marietta, both of Ga., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Jun. 15, 1982, Ser. No. 388,561

Int. Cl.³ C03B *23/04*

U.S. Cl. 65—3.12 **32 Claims**

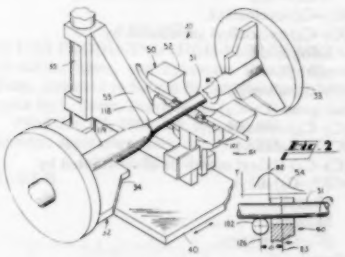


Fig. 2

1. A method of configuring an elongated glass substrate from which lightguide fiber is drawn, said method including the steps of:

supporting each end of the substrate;

exposing an outer surface of each successive increment of length of the substrate to a zone of heat having a temperature profile by causing relative motion between the zone of heat and the substrate; while

causing rotation of the substrate by turning its supported ends; and

causing the substrate to have a central longitudinal axis which is a substantially straight line and to have a predetermined configuration along its length by applying forces in a reproducible manner to successive increments of length of the substrate during exposure to and in a fixed relation to the zone of heat, said forces being applied to each successive increment of length at a distance as measured along the length of the substrate after each successive increment has been exposed to at least an initial portion of the zone of heat.

4,477,274

DEVICE FOR DRAWING AN OPTICAL FIBRE

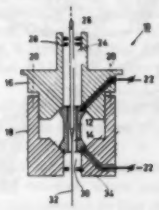
Petrus J. Janssen, and Victor A. van der Hulst, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 14, 1983, Ser. No. 531,973

Claims priority, application Netherlands, Jul. 27, 1983, 8302666

Int. Cl.³ C03B *37/025*

U.S. Cl. 65—13 **7 Claims**



1. A device for drawing an optical fibre from a cylindrical solid preform, which device comprises a heating space having an inlet channel and an outlet channel in which a conical end of a preform is heated to the drawing temperature, said device comprising means to seal the heating space against a gas flow through the gap between the preform and the wall of the inlet channel, characterized in that said means comprise at least one exchangeable flat flexible disc of a polymeric organosilicon compound having a refractive index smaller than that of the preform and a 100% modulus between 0.5 and 5 MPa, said disc comprising a central aperture whose diameter is at least 1 mm smaller than the smallest diameter of the preform to be drawn into a fibre, at least one exchangeable temperature-resistant heat-conducting screening being present between the disc or discs and the heating space, the said screening comprising a central aperture which can pass the preform without making mechanical contact and whose diameter is not more than 1 mm larger than the largest diameter of the preform.

4,477,275

STATION INDICATOR

Harry J. Pauluk, Ocean City, and Otto Zauner, Vineland, both of N.J., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 239,949, Mar. 3, 1981,. This application Jan. 12, 1983, Ser. No. 457,346

Int. Cl.³ C03B *19/00, 35/26, 35/00*

U.S. Cl. 65—158 **5 Claims**

1. An apparatus for tooling a plurality of articles, said apparatus comprising,

a stationary frame

a generally circular carousel mounted on said frame for ratation,

a plurality of tooling fixture means disposed on said carousel for receiving, holding and releasing said articles,

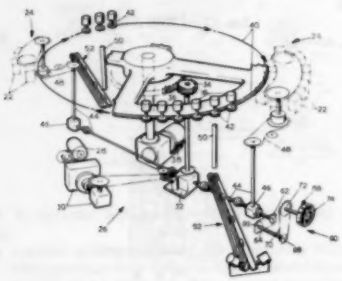
at least one conveyor assembly located near the periphery of the carousel and having a path adjacent to the carousel periphery, the path being spaced from the periphery portion of the carousel and the path including an arcuate path

portion in which all points of the arcuate path portion are about the same distance from the carousel periphery,

a plurality of tooling stations for tooling the plurality of articles, the tooling stations being carried by the conveyor assembly in a closed path in which a portion of the path is adjacent to the tooling fixtures,

indicator means for indicating a particular one of said tooling stations that tooled a particular one of said articles as the particular one article moves past a reference location,

discharge means having the reference location thereon, the discharge means including an inclined chute having its upper end located underneath the path of the tooling fixtures for receiving finished articles from the tooling



fixtures and moving the articles to a discharge end below and spaced away from the periphery of the carousel,

the indicator means including a plurality of moveable displayable indicia,

there being drive means for revolving the tooling fixtures on the carousel around the periphery thereof, for moving the tooling stations on their closed path adjacent to periphery of the carousel, and for moving the indicia of the indicator means, the drive means being so constructed and arranged that each displayable indicia corresponds to the particular one of the tooling fixtures which held the particular one article and to the particular one of the tooling stations which tooled the particular one article.

4,477,276

HETEROCYCLIC PHENYL ETHERS AND THEIR HERBICIDAL USE

Lothar Willms, Unkel; Reinhard Handte, Hofheim am Taunus; Hilmar Mildenberger, Kelkheim; Klaus Bauer, Rodgau; Hermann Bieringer, Eppstein, and Helmut Bürstell, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

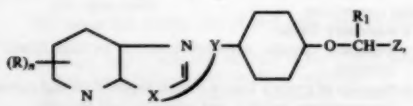
Filed Sep. 22, 1982, Ser. No. 421,331

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1981, 3137996

Int. Cl.[3] **C07D** *498/04, 513/04*

U.S. Cl. 71—94 **9 Claims**

1. A 4-phenoxyalkanecarboxylic acid compound of the formula



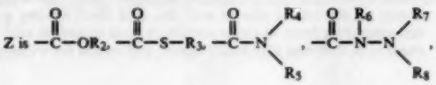
wherein

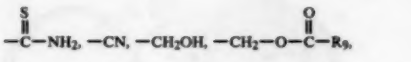
R is halogen, CF_3, NO_2, CN, $(C_1–C_4)$-alkayl, or $(C_1–C_4)$-alkoxy, and n is 0 to 3;

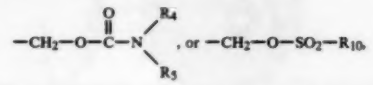
X is S or O;

Y is O, S, SO, SO_2, NH, or N-$(C_1–C_4)$-alkyl;

R_1 is H or $(C_1–C_4)$-alkyl; and







wherein

R_2 is

H,

$(C_1–C_{12})$-alkyl,

$(C_1–C_{12})$-alkyl substituted by at least one member selected from the group consisting of up to 6 halogen atoms, OH, CN, SCN, $(C_1–C_6)$-alkoxy, $(C_1–C_4)$-alkylthio, $(C_1–C_4)$-alkylsulfinyl, $(C_1–C_4)$-alkylsulfonyl, $(C_1–C_6)$-alkoxy-$(C_2–C_6)$-alkoxy, halogeno-$(C_1–C_2)$-alkoxy, methoxyethoxyethoxy, $(C_1–C_4)$-alkylamino, di-$(C_1–C_4)$-alkylamino, phenyl, phenoxy, phenyl or phenoxy mono- or disubstituted by halogen, $(C_1–C_4)$-alkyl, $COOR_3$, or —CO—R_3,

$(C_5–C_6)$-cycloalkyl,

$(C_5–C_6)$-cycloalkyl substituted by halogen or methyl,

$(C_3–C_6)$-alkenyl,

halogeno-$(C_3–C_6)$-alkenyl,

$(C_5–C_6)$-cycloalkenyl,

$(C_3–C_4)$-alkinyl,

$(C_3–C_4)$-alkinyl mono- or di-substituted by $(C_1–C_6)$-alkyl, phenyl, halogen, $(C_1–C_2)$-alkoxy,

phenyl,

phenyl mono-, di-, or tri-substituted by $(C_1–C_4)$-alkyl, $(C_1–C_4)$-alkoxy, halogen, NO_2 or CF_3,

a cation equivalent of organic or inorganic base, or —N=C(R_1)(R_4);

R_3 is

H,

$(C_1–C_4)$-alkyl,

phenyl-$(C_1–C_2)$-alkyl,

phenyl-$(C_1–C_2)$-alkyl mono- or di-substituted by at least one member selected from the group consisting of $(C_1–C_4)$-alkyl and halogen,

$(C_3–C_6)$-alkenyl,

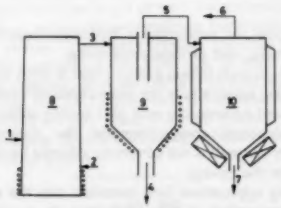
phenyl,

phenyl mono- or di-substituted by at least one member selected from the group consisting of
$(C_1–C_4)$-alkyl and
halogen;
R_4 and R_5, taken alone, are the same or different and are
H,
$(C_1–C_6)$-alkyl,
hydroxy-$(C_1–C_6)$-alkyl,
$(C_5–C_6)$-cycloalkyl,
phenyl, or
phenyl mono- di-, or tri-substituted by
$(C_1–C_4)$-alkyl,
$(C_1–C_4)$-alkoxy,
halogen, or
CF_3,
but R_4 and R_5 are not both phenyl or substituted phenyl, and if R_4 is H or $(C_1–C_4)$-alkyl, the R_5 may be $(C_1–C_4)$-alkoxycarbonyl-$(C_1–C_4)$-alkyl;
R_6 is H or CH_3;
R_7 is H, CH_3 or C_2H_5;
R_8 is H, CH_3, C_2H_5, or phenyl;
R_9 is
$(C_1–C_4)$-alkyl,
$(C_1–C_4)$-alkyl mono-, di- or trisubstituted by halogen,
cyclopropyl,
$(C_3–C_6)$-alkenyl,
phenyl, or
phenyl mono-substituted by
$(C_1–C_4)$-alkyl,
$(C_1–C_4)$-alkoxy,
halogen,
CF_3, or
nitro; and
R_{10} is
$(C_1–C_4)$-alkyl,
phenyl, or
phenyl mono- or di-substituted by
halogen,
CF_3,
NO_2, or
$(C_1–C_4)$-alkyl.

4,477,277
PROCESS FOR PRODUCING HIGH-PURITY METALS

Gianluigi D'Altilia, Rome, and Francesco Rinaldi, Florence, both of Italy, assignors to Samim Societa Azionaria Minero-Metallurgica SpA, Rome, Italy

Filed Jun. 21, 1983, Ser. No. 506,492
Claims priority, application Italy, Jun. 22, 1982, 21977 A/82
Int. Cl.³ B22F 9/00
U.S. Cl. 75—0.5 B **4 Claims**



1. A process for producing high-purity metals from their halides by reducing them with metals in the vapor phase, comprising:
(a) mixing the reducing metal vapour with one or more halides of the required metal either outside or within a primary reaction zone, with possible partial reaction
(b) reacting the reducing metal with the halides of the required metal in a primary reaction zone at a temperature exceeding the dew point of the reducing metal used, preferably greater than 500° C., but less than the solidification temperature of the required metal, and at atmospheric pressure or higher
(c) completing the reaction of point (b) in a cyclone-shaped reaction zone under the same temperature and pressure conditions as the primary reaction zone
(d) separating the required metal in the form of powder from the bottom of the cyclone-shaped reaction zone
(e) recovering the reducing metal halide or halides in a cold trap which operates at a temperature exceeding the dew point of the halide or halides of the required metal, which leave without condensing and are fed to recovery.

4,477,278
STEELMAKING PROCESS USING CALCIUM CARBIDE AS FUEL

Balkishan Agrawal, Ossining, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

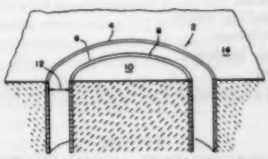
Filed Jan. 6, 1983, Ser. No. 456,113
Int. Cl.³ C21C 7/00
U.S. Cl. 75—51 **20 Claims**

1. In a process of subsurface pneumatic refining of a steel melt wherein calcium carbide is oxidized to provide heat to the melt, the improvement comprising:
(a) providing a bath having dissolved in the melt oxidizable component(s) in an amount, when oxidized, to provide sufficient acidic component(s) to flux the products of the oxidation of calcium carbide provided in the melt in step (b);
(b) providing calcium carbide to the melt;
(c) providing oxygen to the melt to oxidize said oxidizable component(s) at a rate such that the time period that the bath contains both said oxidizable component(s) and calcium carbide provided to the melt in step (b) does not exceed about 5 minutes; and
(d) after step (c), providing gaseous oxygen to the melt to oxidize the calcium carbide to provide heat to the melt.

4,477,279
ANNULAR TUYERE AND METHOD

John D. Nauman, Natrona Heights, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 504,191, Jun. 15, 1983,. This application Nov. 23, 1983, Ser. No. 555,114
Int. Cl.³ C21C 7/00
U.S. Cl. 75—60 **10 Claims**



1. A method for blowing gas into a molten metal bath through a tuyere for processing the molten metal, said tuyere including a tube resistant to corrosive attack by molten metal and slag, and having an annular tip adjacent the molten metal, the method comprising:
monitoring the molten bath temperature;
providing the tuyere with a tube of less than 0.100 inch and an opening of less than 0.062 inch to have the effect to raise the critical bath temperature at which the tuyere would begin to melt; and
adjusting the gas flow as a function of the molten bath tem-

perature to minimize gas flow necessary to cool the tuyere tip.

4,477,280

HEAT RESISTING STEEL

Masao Shiga; Seishin Kirihara, both of Hitachi; Mitsuo Kuriyama, Ibaraki; Takatoshi Yoshioka, and Ryoichi Sasaki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 22, 1982, Ser. No. 452,292
Claims priority, application Japan, Dec. 25, 1981, 56-210950
Int. Cl.³ C22C *38/06*
U.S. Cl. 75—124 **16 Claims**

1. A heat resisting steel having substantially whole tempered martensite structure and exhibiting, when tempered after quenching at 100° C./h, a 10^5-hour creep rupture strength at 600° C. of at least 10 Kg/mm², said steel consisting essentially of, by weight, 8 to 13% of Cr, 0.5 to 2% of Mo, 0.02 to 0.5% of V, 0.02 to 0.15% of Nb, 0.025 to 0.1% of N, 0.05 to 0.25% of C, not greater than 0.6% of Si, not greater tban 1.5% of Mn, no greater than 1.5% of Ni, 0.0005 to 0.02% of Al, 0.1 to 0.5% of W and the balance substantially Fe, the ratio W/Al between W content and Al content ranging between 20 and 80, and the Al and N contents being such that a value given by Al (wt. %)/N (wt. %) is not greater than 0.5.

4,477,281

CORROSION INHIBITING ORGANIC COATINGS

Ezra Sasson, Rehov Pines 81, Petach Tikva, Israel

Continuation-in-part of Ser. No. 267,391, May 26, 1981,. This application Oct. 15, 1982, Ser. No. 434,489
Claims priority, application Israel, Jun. 1, 1980, 60203
Int. Cl.³ C09D *5/08*
U.S. Cl. 106—14.34 **4 Claims**

1. A corrosion inhibiting coating for metal comprising:
candelilla wax;
carnauba wax;
microcrystalline waxes;
white petrolatum;
an oleoresin hardener;
lanolin; and
a solvent comprising a mixture of kerosene and toluene.

4,477,282

NONPIGMENTED WOOD STAINS

Julio A. Fernandez, Caledon, Canada, assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 325,145, Nov. 27, 1981, abandoned. This application May 13, 1983, Ser. No. 494,237
Claims priority, application Canada, Jun. 23, 1981, 380452
Int. Cl.³ C09K *3/00*
U.S. Cl. 106—34 **13 Claims**

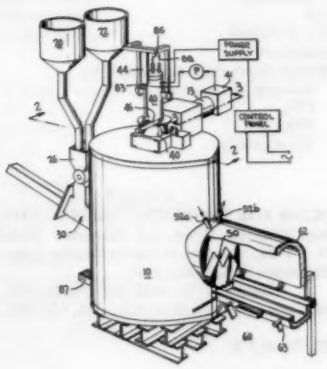
1. A gelled nonpigmented wood stain composition comprising:
(a) from 0.1 to 10% by weight of at least one solvent soluble dye;
(b) at least one cellulosic polymer selected from the group consisting of methyl cellulose, ethyl cellulose, hydroxyethyl cellulose, ethyl hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxybutyl methyl cellulose, ethyl hydroxypropyl cellulose and methyl hydroxypropyl cellulose in an effective amount ranging from 0.2 to 10% by weight; and
(c) from 0.5 to 10% by weight of dibenzylidene sorbitol;
(d) the remainder of the composition comprising a suitable solvent.

4,477,283

PROCESS AND APPARATUS FOR PRODUCING HYDRAULIC CEMENTS

Eddie K. Wilson, Sr., 8284 Dogwood Rd., Germantown, Tenn. 38138, assignor to Eddie K. Wilson, Sr., Memphis, Tenn.

Continuation-in-part of Ser. No. 285,452, Jul. 21, 1981, Pat. No. 4,388,117, which is a continuation-in-part of Ser. No. 165,500, Jul. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 947,599, Oct. 2, 1978, Pat. No. 4,213,791, which is a continuation-in-part of Ser. No. 690,510, May 27, 1976, abandoned. This application May 27, 1983, Ser. No. 497,251
Int. Cl.³ C04B *7/46*
U.S. Cl. 106—100 **16 Claims**



1. A process for producing a hydraulic cement, such as portland cement, said process comprising:
maintaining a melt within a cavity that is lined with a material having substantially the same chemical composition as the desired cement, the melt also having substantially the same chemical composition as the desired cement, whereby the melt is not adversely affected by the material that lines the cavity;
introducing appropriate feed materials into the melt below the upper surface of the melt within the cavity with the feed materials containing compounds suitably proportioned for the desired cement;
heating the melt within the cavity sufficiently to enable the feed materials to be in a molten condition and to chemically combine within the melt, the heating being effected by electrical energy;
withdrawing the melt from the cavity, and
cooling the withdrawn melt to solidify it into a solid substance that has the chemical constituency and properties of the desired cement.

4,477,284

DEMOLITION AGENT FOR DEMOLISHING BRITTLE MATERIALS

Jun Isogai, Oumi; Seiichi Nakaya, Itoigawa; Akira Saitou, Oumi; Akio Takahashi, Nou, and Isao Yagi, Oumi, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1982, Ser. No. 447,573
Claims priority, application Japan, Dec. 12, 1981, 56-200550
Int. Cl.³ C04B 7/32, 13/06
U.S. Cl. 106—104 8 Claims

1. A demolition agent for demolishing brittle materials comprising 30 to 90 parts by weight of a soft-burned quick lime powder having a crystal size of less than 10 microns and a specific surface area of 1,000 to 5,000 cm^2/g (Blaine) and 10 to 79 parts by weight of a rapid hardening hydraulic material comprising amorphous calcium aluminate and calcium sulfate, and further including, relative to 100 parts by weight of the mixture of the soft-burned quick lime and the rapid hardening hydraulic material, 0.5 to 15 parts by weight of a hydration retarder and 0.1 to 5 parts by weight of a water-reducing agent.

4,477,285

METHOD FOR TREATING AN OXIDIZABLE SURFACE

Frederick K. Ault, 3301 W. Petty Rd., Muncie, Ind. 47304

Filed Aug. 31, 1981, Ser. No. 298,207
Int. Cl.³ C23G 1/02
U.S. Cl. 134—3 5 Claims

1. A method for treating a surface susceptible of oxidation which comprises the steps of: rubbing against the surface a composition which comprises the combination of particulate abrasive material and a particulate reducing compound selected from the group consisting of ascorbic acid, erythorbic acid, ascorbate salts, erythorbate salts and mixtures thereof; and

removing said abrasive material from the surface, said step of removing comprising rinsing the surface with deoxygenated water.

4,477,286

BREAKING OIL-IN-WATER EMULSIONS

Christian Rossmann, Langenfeld, and Wolfgang Riedel, Düsseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,790
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208130
Int. Cl.³ C23G 1/36; B01D 17/04
U.S. Cl. 134—10 9 Claims

9. A process for regenerating an oil-in-water emulsion-containing cleaning composition which comprises the steps of:

(a) adding from 0.5 to 50 g/l of 2,4,7,9-tetramethyl-5-decyne-4,7-diol to an emulsion-containing composition comprising (i) neutral to strongly alkaline cleaning solution, (ii) emulsified petroleum oils, fixed oils, or both, and (iii) fats to form separate, aqueous and oily phases, said oily phase containing the 2,4,7,9-tetramethyl-5-decyne-4,7-diol;

(b) separating the oily phase from the aqueous phase; and

(c) replenishing depleted cleaning solution components in the aqueous phase.

4,477,287

LIQUID REMOVAL DEVICE

Donald C. Kush, Pleasanton, and Gary A. Hust, Livermore, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Feb. 8, 1983, Ser. No. 464,818
Int. Cl.³ B08B 5/00, 5/04; B21B 45/02
U.S. Cl. 134—15 17 Claims

8. A method of removing a liquid from the surface of a moving strip comprising the steps of:

(A) Directing the moving strip having liquid on a surface thereof past and in close proximity to a liquid removing device disposed across the width of said strip;

(B) Establishing and maintaining across the width of the surface of the moving strip a partial vacuum through at least one slotted opening disposed across and adjacent the moving strip in order to aspirate and remove the bulk of the liquid on and from the surface of the moving strip;

(C) Next moving the strip past a curtain of a high velocity gas while directing said gas in the form of a curtain generally perpendicular to and across the width of the moving strip's surface so that a substantial portion of the perpendicularly directed gas curtain is redirected upon impact

with the said strip's surface parallel thereto and countercurrent to the movement thereof to remove liquid remaining on the moving surface; and

(D) During passage of said strip from said partial vacuum area to said curtain of high velocity gas preventing the formation of eddy currents in the high velocity gas curtain by establishing a controlled confined gaseous stream and introducing said stream into the gas of the gas curtain intermediate said partial vacuum area and said high velocity gas curtain and maintaining said gaseous stream at a pressure intermediate the pressure level of the gas in the partial vacuum area and the pressure level of the gas in the high velocity gas curtain.

4,477,288

METHOD AND COMPOSITIONS FOR REMOVAL OF UNDESIRABLE ORGANIC MATTER

Thomas F. Kazmierczak, Oradell; Richard Dulina, Edison, and Arthur W. Petersen, Chatham Township, Union County, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 28, 1983, Ser. No. 555,808
Int. Cl.³ B08B 3/08; C09D 9/00
U.S. Cl. 134—19 21 Claims

1. A method for facilitating the removal of undesirable organic matter from a surface which comprises contacting said organic matter with a substantially loosening effective amount of a composition comprising (1) at least one compound selected from imidazole, pyrazole, an alkyl or aryl substituted imidazole, an alkyl or aryl substituted pyrazole, and (2) at least one glycol phenyl ether in synergistic proportions, for a time sufficient to effect a substantial loosening of said organic matter.

4,477,289

METHOD FOR WASHING VOLTAGE TRANSMISSION LINE INSULATORS

Michael P. Kurtgis, 4651 Sheridan St., Hollywood, Fla. 33021

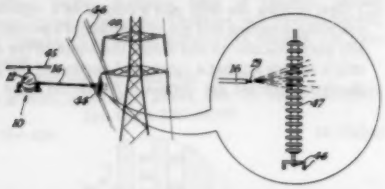
Filed Jul. 22, 1982, Ser. No. 400,738
Int. Cl.³ B08B 3/02
U.S. Cl. 134—34 1 Claim

1. A method of washing contamination from insulation components of energized and non-energized voltage transmission lines, which comprises:

hovering an ungrounded washing apparatus in an airborne platform adjacent to said insulating components,

maneuvering an articulating boom assembly of the washing apparatus into position adjacent to said insulating components inside the stand-off flashover distances for grounded objects,

pressurizing washing fluid within said washing apparatus on said airborne platform,



spraying said pressurized washing fluid onto said insulation components from a nozzle mounted on the distal end of said boom in fluid communication with said washing apparatus,

regulating the discharge of pressurized washing fluid from the nozzle of the boom assembly onto the insulation components.

4,477,290

CLEANING AND ETCHING PROCESS FOR ALUMINUM CONTAINERS

James W. Carroll, Lafayette Hill, and James E. Comstock, West Chester, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 10, 1983, Ser. No. 456,642

Int. Cl.³ C23F *1/00, 7/00;* C23G *1/14*

U.S. Cl. 148—6 **9 Claims**

1. A process for cleaning and etching the surface of an aluminum container comprising spraying the surface with a dilute aqueous alkaline solution consisting essentially of from about 6 to 12 grams per liter of an alkali metal hydroxide and from about 3 to 6 grams per liter of a chelating agent at an elevated temperature from about 80° to 130° F. so as to form a clean, bright surface without desmutting.

8. The process of claim 1 including the steps of forming a conversion coating on the cleaned and etched surface.

4,477,291

METAL-COATING A METALLIC SUBSTRATE

Alfred R. E. Singer, Swansea, Wales, assignor to National Research Development Corporation, London, England

Filed Mar. 1, 1984, Ser. No. 585,148

Claims priority, application United Kingdom, Mar. 9, 1983, 8306428

Int. Cl.³ B05D *3/00*

U.S. Cl. 148—11.5 Q **2 Claims**

1. A method of coating a metallic substrate with a metallic coatant, wherein the coatant metal (or alloy) is one which wets the substrate metal and wherein the substrate metal (or predominant substrate metal) is one whose oxide is reducible below its solidus temperature, which solidus temperature must exceed the liquidus temperature of the coatant metal,

the method comprising:

heating the substrate in a reducing atmosphere until substantially no oxide remains on it,

then, without permitting intervening oxidation, maintaining the substrate in a reducing or neutral atmosphere at from 0.5 to 0.9 of the liquidus temperature (in degrees absolute), and spraying molten coatant thereon to a thickness not exceeding 150 microns or sequentially spraying two or more coatings each not exceeding 150 microns,

then, without permitting intervening oxidation, maintaining the sprayed substate in a reducing or neutral atmosphere at from 0.5 to 0.9 of the liquidus temperature of the coatant, the temperature moreover being such that the coatant has a yield stress of at most half that of the substrate, and rolling the sprayed substrate to strain the substrate by at most 2% but sufficiently to ensure substantially complete consolidation of the coatant.

4,477,292

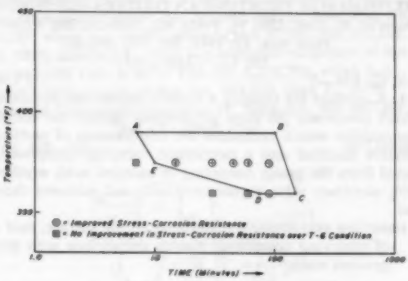
THREE-STEP AGING TO OBTAIN HIGH STRENGTH AND CORROSION RESISTANCE IN AL-ZN-MG-CU ALLOYS

Melvin H. Brown, Freeport, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 142,541, Apr. 21, 1980, , which is a continuation of Ser. No. 410,109, Oct. 26, 1973, abandoned. This application Oct. 15, 1981, Ser. No. 311,552

Int. Cl.³ C22F *1/04*

U.S. Cl. 148—20 **13 Claims**



1. In a method for heat treating an article comprising a solution heat treated aluminum alloy of the 7000 series, said alloy containing aluminum, zinc, magnesium, copper and at least one element selected from the group consisting of chromium, manganese and zirconium, said method comprising the steps of

(a) precipitation hardening the article at about 175° to 325° F.;

(b) heat treating the article by immersing it in a heat treating medium; and

(c) precipitation hardening the article at about 175° to 325° F.;

the improvement wherein step (b) is carried out for about 10 minutes to a few hours at a temperature of about 360° to 375° F., said method thereby being suitable for treatment of articles having greater maximum thickness than methods in which step (b) is carried out at greater than 390° F.

4,477,293

LINK AND WINDSCREEN WIPER MECHANISM

John P. Timmis, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, Great Britain

Filed Dec. 9, 1981, Ser. No. 329,038

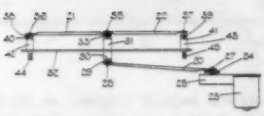
Claims priority, application United Kingdom, Dec. 10, 1980, 8039507

Int. Cl.³ C23C *11/16;* F16C *11/05;* B60K *1/18*

U.S. Cl. 148—31.5 **8 Claims**

1. A link formed of a configurated strip of non-alloy steel

having nitrogen diffused through substantially the whole of the section of the strip, the nitrogen being in solid solution in a



ferritic matrix, and the strip having at least one integral bush bearing defined by part of the strip.

4,477,294

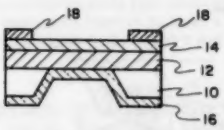
METHOD OF FORMING GAAS ON $AL_yGA_{1-y}AS$ TRANSMISSION MODE PHOTOCATHODEHODE

William A. Gutierrez, and Herbert L. Wilson, both of Woodbridge, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 260,958, May 6, 1981, abandoned. This application Jun. 22, 1983, Ser. No. 489,632

Int. Cl.³ H01L *21/208*

U.S. Cl. 148—171 **12 Claims**



1. A method of reproducibly forming a large high sensitivity negative electron affinity infrared transmission mode, single crystalline GaAs on AlGaAs photocathode structure by hybrid epitaxy, the steps of forming said photocathode structure comprising:

providing and preparing a high quality single crystalline seed crystal by chemically etching a growth surface;

epitaxially growing a lightly p-doped ($0.5–1.0\times10^{18}$ cm^{-3}) 60–80 micron thick $Al_yGa_{1-y}As$ passivating window layer on the chemically etched growth surface of said single crystalline seed crystal by liquid phase epitaxy in which the step is carried out in a ultra high purity hydrogen atmosphere where the composition corresponds to a bandgap greater than 1.8 eV by adjusing the GaAl composition of the melt wherein elemental zinc is added to the melt to provide the p-type dopant;

mechanically-chemically polising the liquid phase epitaxially grown surface of said passivating window layer to eliminate any surface irregularities and produce a blemish free specular surface of high optical quality;

growing a high transmission photosensitivity p-doped (5×10^{18} cm^{-3}) GaAs photoemitting layer of controlled homogeneous thickness of about one micron onto said passivating window layer by vapor phase epitaxy technique using an open tube process with $HCl\text{-}Ga\text{-}AsH_3\text{-}H_2$ as reagents and elemental zinc as the p-type dopant;

activating said GaAs photoemitting layer to a state of negative electron affinity by heat cleaning in vacuum and applying monolayers of cesium and oxygen; and

providing a window area and supporting said photoemitting layer-passivating window layer composite of said photocathode structure by a support means.

4,477,295

METHOD FOR FABRICATING CONVEYOR WORMS OR THE LIKE

Alexander Kohnhauser, Kapfenberg, Austria, assignor to Vereinigte Edelstahlwerke AG (VEW), Vienna, Austria

Filed Aug. 16, 1982, Ser. No. 408,420

Claims priority, application Austria, Sep. 4, 1981, 3832/81

Int. Cl.³ B65G *33/08*

U.S. Cl. 148—11.5 Q **6 Claims**

1. A method of fabricating conveyor worms containing a steel core and a high wear resistant plating comprising the steps of:

fabricating a compound metal blank by forging or hot rolling a substantially rod-shaped steel core provided with a snugly bearing sleeve formed of high wear resistant plating material while forming a metallic bond between the core and the sleeve and while reducing the sleeve diameter by at least 20%;

soft annealing the blank and then forming the worm profile by a machining operation;

then carrying out a thermal treatment composed of hardening and tempering in order to set the hardness of the plating material and that of the core material; and

then accomplishing a finished machining operation to obtain desired final dimensions of the conveyor worm.

4,477,296

METHOD FOR ACTIVATING METAL PARTICLES

Kumaran M. Nair, East Amherst, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 30, 1982, Ser. No. 430,871

Int. Cl.³ C23C *1/10*; C22C *1/04*; B22F *9/00*; C22B *11/04*

U.S. Cl. 148—6.14 R **8 Claims**

1. A method for activating the surface of finely divided particles of conductive metals having a thin surface coating of oxide of the conductive metal comprising the steps of (a) treating the surface with an aqueous solution of a reducing agent for the oxide when the conductive metal is a noble metal and either a reducing agent for the oxide or an inorganic acid capable of reacting with the oxide to form a water-soluble salt of the metal ion when the conductive metal is a base metal, the reactive component of the aqueous solution being in molar excess of the oxide, (b) washing the surface of the treated particles with an aqueous liquid having a pH of 5.5–7.0 until essentially no change in pH takes place in the wash liquid, and (c) drying the surface of the washed particles.

4,477,297

MANUFACTURE OF GEL FREE NITROCELLULOSE LACQUERS

Minn-Shong Chi, Cumberland, Md., assignor to Hercules Incorporated, Wilmington, Del.

Filed Feb. 28, 1983, Ser. No. 470,845

Int. Cl.³ C06B *45/10*

U.S. Cl. 149—109.6 **4 Claims**

1. A method of manufacturing a gel free nitrocellulose lac-

quer suitable for crosslinking in a propellant composition, said method comprising:

(a) forming a lacquer premix by dispersing nitrocellulose in polyol polymer in the presence of a liquid, solvent that (i) has non-flammable vapors, (ii) is miscible with said polyol polymer and nitrate ester plasticizer, and (iii) is low boiling, said solvent being included in an amount sufficient to reduce the viscosity of said polyol polymer;

(b) adding to said lacquer premix each explosive nitrate ester plasticizer, which may be appropriately diluted with said solvent, to be included in said lacquer;

(c) sparging the results of step (b) with an inert gas for a time sufficient to reduce the content of said solvent and water, if any, respectively, to below about 0.02% by weight and form said gel free nitrocellulose lacquer.

4,477,298

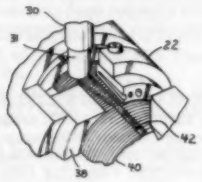
CABLE SHIELDING METHOD AND APPARATUS

William D. Bohannon, Jr.; Michael D. Kinard, both of Lawrenceville, and Randy G. Schneider, Norcross, all of Ga., assignors to AT&T Technologies, Inc., New York, N.Y.

Continuation of Ser. No. 257,671, Apr. 24, 1981, abandoned. This application Sep. 24, 1982, Ser. No. 423,405

Int. Cl.³ H01B *13/26*

U.S. Cl. 156—54 **4 Claims**



1. A method of shielding a cable core comprising the steps of:

(a) introducing the core and a strip of corrugated metallic shielding material into a shield forming die with the strip positioned at least partially about the core;

(b) bringing opposed longitudinal side portions of the corrugated strip into a position of mutual adjacency with one side portion of the strip partially overlaid by the other side portion and with their corrugations substantially aligned;

(c) coating the one side portion along a portion thereof which is not overlaid by the other side portion with adhesive;

(d) bringing the strip into a position with the other side portion overlaying and pressed against the adhesive coated one side portion; and

(e) advancing the core and strip out of the shield forming die.

4,477,299

METHOD OF BONDING A FLOOR-COVERING WEB WITH A BACKING WEB

Hans-Joachim Friedrich, Auenwald, Fed. Rep. of Germany, assignor to J. F. Adolff AG, Backnang, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 355,496

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113636

Int. Cl.³ B32B *31/08*; C09J *5/06*

U.S. Cl. 156—72 **10 Claims**

1. In a method for forming a water permeable floor covering from a water-permeable surface web and an underlying elastic backing web; said surface web comprising an upper pile surface secured on a carrier layer having openings for water penetration; said surface web also being partially coated on its underside with a thermoplastic material for bonding to such elastic backing web which is partially coated on a first area of its upper surface with a thermoplastic material; said backing web also having apertures defining a second area which is water permeable; said method comprising the steps of synchronously guiding the surface web underside and the backing web upper surface along predetermined paths of movement and in facing relation with a heat source; plasticizing at least a portion

of the thermoplastic material disposed on the surface web underside and the backing web upper surface; urging the surface web underside and the backing web upper surface into mutual engagemwent whereby plasticized thermoplastic material of said backing web surface and said surface web underside fuse together and said surface covering web and said backing web are bonded together.

4,477,300

CEMENTITIOUS BOARD MANUFACTURE

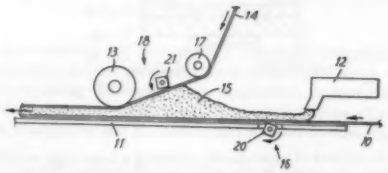
Thomas A. Pilgrim, Edwalton, England, assignor to BPB Industries Public Limited Company, London, England

Filed Apr. 26, 1983, Ser. No. 488,677

Claims priority, application United Kingdom, Apr. 30, 1982, 8212648

Int. Cl.³ B32B *31/12, 31/16*

U.S. Cl. 156—44 **9 Claims**



1. A process for the manufacture of cementitious board comprising the steps of: depositing a slurry of hydraulic cementitious material between two

upper and lower facing sheets; causing air trapped in the slurry to rise as bubbles through the slurry by vibrating the lower sheet after the slurry has been deposited on it but before it comes into contact with the upper sheet; bursting the resulting bubbles at the upper surface of the slurry by vibration of the upper sheet when it comes into contact with the slurry; and forming the slurry between the sheets to the desired width and thickness before setting.

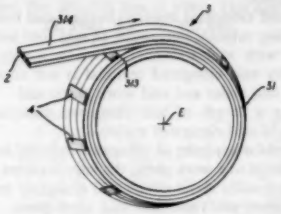
4. Apparatus for manufacturing cementitious board comprising: means for advancing a lower facing sheet; means for depositing hydraulic cementitious slurry on the upper surface of such sheet; means for applying an upper facing sheet to the upper surface of the slurry; first vibration means disposed beneath the lower sheet to vibrate the same at a location between the slurry deposition means and the zone where the upper sheet comes into contact with the slurry; second vibration means disposed above the upper sheet in the said zone to vibrate the second sheet; and means for forming the slurry between the two facing sheets to the desired width and thickness before setting.

4,477,301

PROCESS FOR HOLDING TOGETHER THE WIRES OF A PACKAGE BEAD RING FOR TIRES

Maurice Bouju, and Jean-Louis Charvet, both of Clermont-Ferrand, France, assignors to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed May 11, 1983, Ser. No. 493,691
Claims priority, application France, May 17, 1982, 82 08751
Int. Cl.³ B29H *17/32*; B65H *55/00, 81/00*; B60C *15/04*
U.S. Cl. 156—136 4 Claims



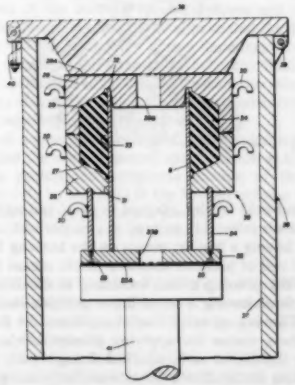
1. A process for manufacturing a package bead ring for tires having a rectilinear frustoconical radically inner face and formed of at least two layers of at least two adjacent wires, preferably metallic wires, of rectangular cross-section wound alongside each other from layer to layer and from wire to wire on a conical manufacturing form after permanent bending of the wires by deviated flexion characterized by the fact that during the winding of the layers of wires a piece of ribbon, which is formed of a thin flexible support resistant to shear in the radial direction between two adjacent wires and which is of a thickness at most equal to 0.5 mm and preferably less than 0.3 mm, is interposed at irregular or regular intervals at least twice per revolution between two consecutive layers of wires, the support bearing on each of its faces a layer of a material which is adherent both to the support and to the wires.

4,477,302

METHOD OF MAKING SHOCK CELLS

Raymond F. Leblanc, North Canton, and William T. Cummins, Mogadore, both of Ohio, assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 257,881, Apr. 27, 1981, Pat. No. 4,408,931.
This application Jun. 16, 1983, Ser. No. 505,430
Int. Cl.³ B23P *11/02*
U.S. Cl. 156—165 1 Claim



1. The method of making an energy-absorbing shock cell for mounting devices on outwardly downwardly slanting legs of offshore oil rig structures; wherein the shock cell comprises an assembly of an inner steel pipe member of predetermined length, an outer steel pipe member free of circumferential welds having varying lengths from shock cell to shock cell, and a rubber sleeve vulcanized-bonded to and surrounding a cylindrical outer surface portion of one end of said inner pipe member, and post-vulcanized-bonded to and surrounded by a cylindrical inner surface portion of one end of said outer pipe member; wherein the inner pipe member projects axially outward of said outer pipe member from the rubber sleeve; and wherein the sleeve rubber is under extreme compression between its vulcanized bonds with said pipe members capable of absorbing energy by deflection of the rubber under compression when external force is applied to the outer end of the inner pipe member; the improvement which comprises:

(a) providing a mold assembly having separable upper and lower mold members each having mold cavity portions which form an annular circumferentially inwardly opening rubber insert mold cavity trapezoidal-shaped in cross section with similar conically tapered ends, in which the mold assembly has a central opening in the upper end of the upper mold member and in the lower end of the lower mold member, and in which said lower mold member central opening has the same diameter as that of an inner pipe member cylindrical outer surface portion to which a rubber insert is to be vulcanized-bonded in said mold assembly cavity;

(b) coating a cylindrical outer surface portion at one end of an inner pipe member with an adhesive vulcanized-bonding agent;

(c) surrounding said inner pipe member coated surface portion with uncured rubber sufficient to fill said mold cavity;

(d) inserting the other end portion of said inner pipe member into and through the lower mold cavity central opening to rest on a bottom plate having a central opening supported on a pot heater hydraulic ram;

(e) assembling the upper mold member with the lower mold member to complete the formation of a mold cavity compartment formed by said mold assembly inwardly opening rubber insert cavity and said one inner pipe member end, and with said uncured rubber contained in said compartment;

(f) clamping said mold assembly and said inner pipe member in a compartment of said pot heater by said ram against a pot heater compartment lid;

(g) introducing steam into the pot heater compartment around the mold assembly and into said inner pipe member through said central openings in said upper mold member and said bottom plate to vulcanize said uncured rubber and form a rubber insert adhesively vulcanized-bonded to said inner pipe member thereby forming a shock cell subassembly;

(h) removing said subassembly from said mold assembly;

(i) the subassembly molded rubber insert having an outer diameter greater than the inner diameter of an outer shock cell pipe member to be bonded thereto;

(j) coating an adhesive on the cylindrical inner surface portion of one end of an outer pipe member to be bonded to said rubber insert;

(k) shooting said subassembly rubber insert into the inner end of an outer pipe member to deform the insert rubber into a rubber sleeve held under compression between the end portions of said inner and outer pipe members; and

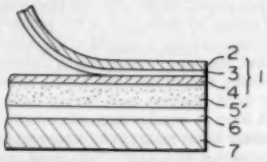
(l) post-vulcanized-bonding said rubber sleeve to said outer pipe member in a pot heater to produce a shock cell having a rubber sleeve under a state of high compression bonded to and between end portions of said inner and outer shock cell pipe members;

(m) whereby shock cells having varying lengths of outer pipe members free of circumferential welds may be made without requiring individual molds for each shock cell outer pipe member length.

4,477,303
PROCESS FOR PREPARATION OF SURFACE-PROTECTING ACRYLIC FILM

Makoto Ohe, and Koichiro Sugi, both of Tokyo, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1982, Ser. No. 345,357
Claims priority, application Japan, Feb. 13, 1981, 56-19806; Feb. 16, 1981, 56-21269; Feb. 17, 1981, 56-22038
Int. Cl.³ B44C *1/00*; B32B *7/00, 7/04, 27/32*
U.S. Cl. 156—230 5 Claims



1. In a process for preparing a laminate polymer article having an alkyl methacrylate polymer film uniformly laminated on at least one surface of the body of a polymer article formed from a prepolymer composition containing said prepolymer composition in combination with a polymerizable monomer, a solvent or a mixture thereof, the improvement comprising:

laminating on the prepolymer composition a composite acrylic film comprising (i) a carrier film insoluble in the polymerizable monomer and the solvent and (ii) an alkyl methacrylate polymer film soluble in or swellable with the polymerizable monomer and the solvent, said carrier film and said alkyl methacrylate polymer film being adhered to each other through an adhesive layer capable of adhering relatively weakly to the alkyl methacrylate film and adhering relatively strongly to the carrier film and incapable of being dissolved in the polymerizable monomer and the solvent, so that the alkyl methacrylate polymer film is in contact with the surface of the prepolymer composition;

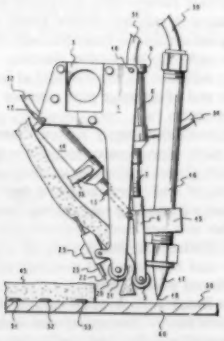
polymerizing the prepolymer composition; and then,

peeling the carrier film together with the adhesive layer from the resulting polymer article.

4,477,304
APPLICATION TOOL

Karl H. Westermann, Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 1, 1983, Ser. No. 510,046
Int. Cl.³ B32B *31/12, 35/00*
U.S. Cl. 156—250 8 Claims



1. In a process for applying an elongated material from a supply of such material to a work piece, the improvement comprising:

threading said elongated material around a transport roller for travel thereabout;

depositing a limited area of liquid adhesive to said work piece;

engaging said elongated material with a portion of said limited area of said liquid adhesive by movement of said transport roller into a first position whereby said elongated material is compressed between said roller and said work piece;

feeding said elongated material beyond said limited area by providing relative movement of said tool and said work piece, with said transport roller in a second position whereby said elongated material is not compressed between said roller and said work piece; and

separating a length of said elongated material from said supply of said elongated material.

2. In a tool for applying an elongated material from a supply of such material to a work piece, the improvement comprising:

a transport roller about which said elongated material travels between said roller and said work piece;

means for moving said transport roller into a first position whereby said elongated material is compressed between said roller and said work piece and into a second position whereby said elongated material is not compressed between said roller and said work piece;

adhesive application means for depositing a limited area of liquid adhesive to said work piece;

means for engaging said elongated material with a portion of said limited area of liquid adhesive by movement of said transport roller into said first position;

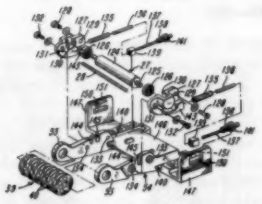
means for feeding said elongated material beyond said limited area with said transport roller in said second position; and

means for separating a length of said elongated material from said supply of said elongated material.

4,477,305
LABELER

Paul H. Hamisch, Jr., Franklin, and John D. Mistyurik, Tipp City, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 12, 1983, Ser. No. 484,344
Int. Cl.³ B65C *11/02*
U.S. Cl. 156—384 14 Claims



1. A hand-held labeler adapted to print and apply pressure sensitive labels releasably secured to a carrier web, comprising: a housing having a handle, means on the housing for supporting a label roll of pressure sensitive labels, means for printing on labels, the printing means including an electrically selectable print head having a set of linear printing elements and a platen roll having an axis of rotation, means for delaminating printed labels, means for applying printed labels, means for advancing the carrier web, means defining a path for guiding the web from the label roll, to between the printing means and the platen roll, to the delaminating means and to the web advancing means, the printing elements and the platen roll extending laterally to the path of the carrier web, and means

for changing the orientation of the set of printing elements and the platen roll relative to each other to bring the linear printing elements parallel to the axis of the platen roll.

4,477,306

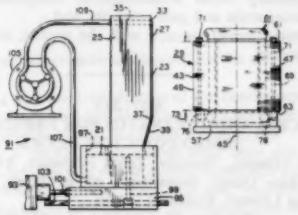
LAMINATED CORE, APPARATUS AND METHODS

Alvin L. Rediger, Zeeland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 183,176, Sep. 2, 1980,. This application Jul. 28, 1982, Ser. No. 402,466

Int. Cl.³ H02K *15/00*

U.S. Cl. 156—578 **2 Claims**



1. Apparatus for applying a hardenable fluid adhesive material to at least one preselected peripheral portion of an inductive device laminated magnetic core, and transferring the fluid material into the core, the apparatus comprising:

first means for supporting a downwardly flowing beaded column of the fluid material in at least one preselected flow path;

second means for moving the first means and thus such flow path between spaced apart protracted and retracted positions;

third means for supporting the laminated magnetic core in a preselected position so that the edges of laminations therein are oriented transversely with respect to the direction of flow of the flowing beaded column;

receiving means for receiving fluid flowing from the bottom of the beaded column; and

supply means for supplying fluid from the receiving means to the first means and for establishing and maintaining the downwardly flowing beaded column;

said second means being operable for moving the flow path to its protracted position while the core is in its preselected position, and for effecting surface to surface engagement of the flowing beaded column and the preselected peripheral portion of the core so that the fluid in the column flows downwardly across the edges of the transversely disposed core laminations whereby fluid from the column is transferred by capillary action directly from the flowing column into the core between predetermined ones of next adjacent core laminations;

said second means being effective for maintaining the first means and the core in spaced apart relation at all times so that the preselected peripheral portion of the core is touched only by the fluid in the beaded column while the flow path is in its protracted position.

4,477,307

FRICTION WELDED FASTENER SYSTEM

Steven V. Cearlock, Batavia; Francis C. Peterson, St. Charles, and Gene S. Kunos, Elgin, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 6, 1982, Ser. No. 446,899

Int. Cl.³ B23K *27/00*; B32B *31/00*; G05G *15/00*; B29C *27/08*

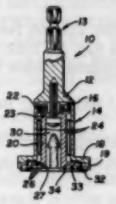
U.S. Cl. 156—580 **4 Claims**

1. A friction welded fastening system comprising:

(a) a thermoplastic fastener adapted to be fused to workpiece, said fastener having, a primary fastening element, a base carrying said element, said base having a surface adapted to be fused to said workpiece by heat of friction induced by application of rotative and axial forces applied to said fastener,

(b) a tool for rotating and applying pressure to said fastener,

(c) means to automatically stop rotation of said fastener when a predetermined amount of fusion between said



fastener and said workpiece is achieved, said means including at least one heat sensitive thermoplastic protrusion adjacent the outer perimeter of said surface and at least one projection on said tool, whereby when said protrusion reaches a predetermined minimum strength, said projection causes said protrusion to yield and said fastener stops rotating.

4,477,308

HETEROEPITAXY OF MULTICONSTITUENT MATERIAL BY MEANS OF A TEMPLATE LAYER

John M. Gibson, Upper Montclair; John M. Poate, Summit, and Raymond T. Tung, Berkeley Heights, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 30, 1982, Ser. No. 429,291

Int. Cl.³ C30B *23/06*

U.S. Cl. 156—603 **22 Claims**

1. A method for producing a heterostructure comprising epitaxial multiconstituent first material on a substrate comprising a second material, with the second material differing in chemical composition from the first material, the method comprising:

(a) growing on at least a part of the substrate, at a growth temperature, epitaxial first material comprising material deposited on the substrate,

Characterized in that the methd further comprises:

(b) depositing, prior to (a), substantially spatially uniformly on at least the part of the substrate, an effective amount of matter, to be referred to as template-forming material, the template-forming material comprising at least one of the chemical constituents of the first material and differing in chemical composition from at least the second material, the substrate being during deposition of the template-forming material at a deposition temperature that is substantially lower than a transformation temperature, whereby the template-forming material deposit is in substantially disordered form, and

(c) raising, subsequent to (b) but still prior to (a), the temperature of the substrate with the template-forming material thereon to a transformation temperature, the transformation temperature being lower than the growth temperature, whereby a template material is formed on the sub-

strate, the thus produced composite forming the substrate referred to in (a).

4,477,309

CORRECTION OF GRAVURE PRINTING MEMBERS

Elzbeita Chudy; Nicolette Gamson, and Phillip R. Kellner, all of London, England, assignors to Crosfield Electronics Limited, London, England

Continuation of Ser. No. 210,660, Nov. 26, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 430,177

Claims priority, application United Kingdom, Dec. 11, 1979, 7942707

Int. Cl.³ B41C *1/00*; B44C *1/22*

U.S. Cl. 156—635 11 Claims

1. A process of deepening gravure cells of a gravure printing surface by etching with an etching composition the base of the cells to be deepened and thereby effecting positive correction of the gravure printing surface, characterized in that the process comprises depositing into the cells to be deepened a heat activatable etching composition that is a powder, a liquid or a paste and that is substantially inert to the cells at the temperature of deposition, heating the composition to a temperature at which it etches the cells, and, after the desired correction has been effected, terminating the etching by washing and/or cooling the surface, wherein cells which are not to be deepened and which are adjacent to those that are to be deepened are left unprotected during the process of deepening the cells which are to be deepened.

4,477,310

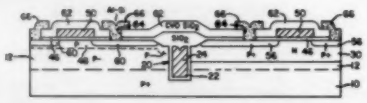
PROCESS FOR MANUFACTURING MOS INTEGRATED CIRCUIT WITH IMPROVED METHOD OF FORMING REFRACTORY METAL SILICIDE AREAS

Hee K. Park, Portland, and Tadanori Yamaguchi, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 12, 1983, Ser. No. 522,885

Int. Cl.³ H01L *21/306, 7/44*; C23F *1/02*; B05D *5/12*

U.S. Cl. 156—643 7 Claims



1. Process for manufacturing an integrated circuit including a plurality of insulated gate field effect transistors, comprising the steps of:

a. forming a monocrystalline semiconductor substrate of P or N type conductivity with an epitaxial layer thereon of the same type of conductivity including a channel portion;

b. forming a gate insulation layer of semiconductor oxide on the channel portion of said epitaxial layer;

c. depositing a gate element of doped semiconductor material on said gate insulation layer to form therewith an insulated gate extending above the surface of the epitaxial layer;

d. depositing source and drain elements in said channel portion of said epitaxial layer on opposite sides of said gate portion, said source and drain having opposite conductivity to said channel portion;

e. depositing a side wall layer of semiconductor oxide on the sides of the insulated gate over ends of the gate insulation and the gate element;

f. coating said source, drain and gate elements and said side wall layer with a double layer of refractory metal including an inner layer of a first low resistivity refractory metal of 3 ohms per square resistivity or less which when heated to a predetermined temperature forms a refractory metal compound with the semiconductor material of the source, drain and gate elements but not with the semiconductor oxide of the side wall portion, and an outer layer of second higher resistivity refractory metal which does not oxidize as readily as said inner metal, said outer layer being coated over said inner layer;

g. heating said coated substrate at said predetermined temperature to cause said inner layer to form a refractory metal semiconductor compound with the source, drain and gate elements while oxidation of the outer surface of said inner layer is prevented by the protective covering of said outer layer;

h. selectively etching the double layer of refractory metal to remove the outer layer and to remove portions of the inner layer from said side wall layer without removing the refractory metal semiconductor compound from the source, drain and gate elements; and

i. forming metal contacts with the source, drain and gate elements.

4,477,311

PROCESS AND APPARATUS FOR FABRICATING A SEMICONDUCTOR DEVICE

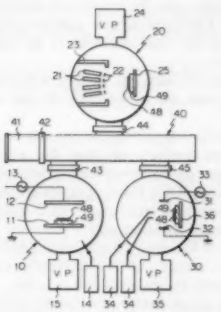
Takashi Mimura, Machida; Kohki Hikosaka, Yokohama, and Kouichiro Odani, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 15, 1983, Ser. No. 561,967

Claims priority, application Japan, Dec. 28, 1982, 57-229708

Int. Cl.³ H01L *21/306, 7/36*; B05D *5/12*; C23C *13/08*

U.S. Cl. 156—643 43 Claims



1. A process for fabricating a semiconductor device, comprising the steps of:

etching a part of a semiconductor substrate by hydrogen plasma in vacuum;

growing a semiconductor layer on the semiconductor substrate at the etched part by molecular beam epitaxy with unbroken vacuum; and

forming a protective layer on the surface of the semiconductor layer with unbroken vacuum.

4,477,312

COMPOSITE FOIL FROM WHICH LAYER AREAS HAVING METALLIC LUSTER ARE TRANSFERRED ONTO A BASE

Eleonore Czichy, Augsburg, Fed. Rep. of Germany, assignor to Interletter AG

Continuation of Ser. No. 281,287, Jul. 7, 1981, abandoned. This application May 31, 1983, Ser. No. 498,668

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026236

Int. Cl.³ B41M *3/14*; B44C *1/22*

U.S. Cl. 156—656 7 Claims

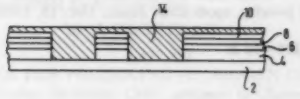
1. A method for the production of a composite foil from which metallically lustrous layer areas having an image structure are to be transferred onto a base, and having a carrier layer, a lacquer layer on the carrier layer, a metal layer on the

lacquer layer and an adhesive layer on the metal layer which comprises

(a) applying at least one continuous lacquer layer on the carrier layer;

(b) applying a continuous metal layer onto the at least one lacquer layer;

(c) applying a solvent resistant layer onto the metal layer, said solvent resistant layer being divided into areas which have the shape of the image structure, leaving areas of the continuous metal layer and the at least one continuous



lacquer layer thereunder uncovered by the solvent resistant layer;

(d) removing said uncovered areas of the continuous metal layer and the at least one continuous lacquer layer thereunder by treatment with a solvent therefor; and

(e) applying a continuous adhesive layer onto the image structure carrying side of the treated composite foil from step (d), which adhesive layer fills said removed areas between the image structure and covers said areas and said image structure.

4,477,313

METHOD AND APPARATUS FOR PRODUCING A MULTILAYER PAPER WEB

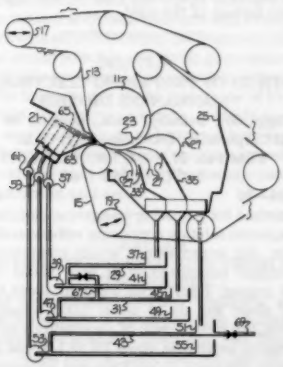
Anders I. Andersson, Hammarö, Sweden, assignor to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

Filed Sep. 22, 1982, Ser. No. 421,043

Claims priority, application Sweden, Dec. 3, 1981, 8107215

Int. Cl.³ D21H *1/02*; D21F *1/66*

U.S. Cl. 162—123 **10 Claims**



1. A method for producing a multilayer paper web in a twin-wire former of the kind in which an outer wire and an inner wire define a curved forming zone, to which at least two different stocks are delivered from a multilayer headbox, and from which forming zone white water first passes out through the outer wire and then is thrown outwardly, collected and substantially returned to the papermaking process, said method comprising collecting separately as different fractions the white water discharged through the outer wire from a first portion and at least one succeeding portion of the curved forming zone, returning in a first separate circuit the first fraction collected nearest the headbox and mixing it with a first thick stock to form a first stock of headbox consistency, from which a first layer is to be formed directly on the outer wire in relation to the curved forming zone, and returning in a second separate circuit at least a portion of a second fraction collected at a greater distance from the headbox and mixing it with a second thick stock to form a second stock of headbox consistency, from which a second layer, superimposed on the first layer, is to be formed.

4,477,314

METHOD FOR DETERMINING SUGAR CONCENTRATION

Gerhard Richter, Erlangen; Günter Luft, Lauf, and Ulrich Gebhardt, Langensendelbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 20, 1983, Ser. No. 515,704

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228551

Int. Cl.³ G01N *27/52*

U.S. Cl. 204—1 T **9 Claims**

1. An improved method for measuring the sugar content of a fluid in the presence of interfering foreign substances by means of an electrocatalytic sugar sensor which includes a test electrode having a membrane arranged in front of it, said method including the steps of applying potentiostatically to said electrode a reactivation potential and a test potential and measuring and evaluating a current flowing during a test period with a set time delay to determine sugar content said improvement including the step of:

applying a reduction potential for a period of time shorter than said test period to said test electrode to reduce the effect of said interfering foreign substances, said reduction potential being more negative than said test potential and being applied after the application of said reactivation potential and prior to the application of said test potential.

4,477,315

TRIVALENT CHROMIUM ELECTROLYTE AND PROCESS EMPLOYING REDUCING AGENTS

Thaddeus W. Tomaszewski, Troy, Mich., assignor to OMI International Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 205,406, Nov. 10, 1980, Pat. No. 4,392,922. This application May 12, 1983, Ser. No. 492,302

Int. Cl.³ C25D *3/06*

U.S. Cl. 204—1.5 **20 Claims**

1. An aqueous acidic trivalent chromium electrolyte containing trivalent chromium ions, a complexing agent for maintaining the trivalent chromium ions in solution, halide ions, ammonium ions, hydrogen ions to provide a pH on the acid side, and a reducing agent comprising an ion selected from the group consisting of scandium, yttrium, lanthanum, titanium, hafnium, arsenic, selenium, tellurium, cerium, uranium, and mixtures thereof present in an amount effective to maintain the concentration of hexavalent chromium ions at a level at which satisfactory chromium electrodeposits are obtained.

4,477,316

LONG-LIFE INSOLUBLE ELECTRODE AND PROCESS FOR PREPARING THE SAME

Kango Sakai; Ryoichi Yoshihara, both of Kitakyushu; Hiroshi Sakurai, and Katsuhiro Minamida, both of Kawasaki, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 22, 1982, Ser. No. 351,302

Claims priority, application Japan, Feb. 23, 1981, 56-25090

Int. Cl.³ B05D *1/08, 3/06*; C25B *11/60*; C25C *7/02*

U.S. Cl. 204—290 F **20 Claims**

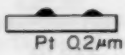
1. A long-life insoluble electrode for use in sulfuric acid plating baths, comprising:

an electroconductive, corrosion resisting base metal;

at least on metal layer applied on the surface of said electroconductive, corrosion resisting base metal, said at least

one metal layer consisting of at least one metal of the platinum group; and,

an alloy layer having a thickness of not more than 1 μm between said electroconductive, corrosion resisting base



metal and said at least one metal layer, said alloy layer resulting from laser beam irradiation which causes diffusion of said platinum group metals from said at least one metal layer into said electroconductive, corrosion resisting base metal.

4,477,317

ALUMINUM SUBSTRATES USEFUL FOR LITHOGRAPHIC PRINTING PLATES

Simon L. Chu, Dobbs Ferry; Eugene Golda, Monsey; Jen-Chi Hua 2, Ossining, and Alan Wilkes, Brewster, all of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Continuation of Ser. No. 332,795, Dec. 21, 1981, abandoned, and a continuation-in-part of Ser. No. 129,432, Mar. 11, 1980, abandoned, which is a continuation of Ser. No. 800,132, May 24, 1977, abandoned. This application Oct. 31, 1983, Ser. No. 547,194

Int. Cl.³ B41N *3/02*; C25D *5/44*

U.S. Cl. 204—33 **5 Claims**

1. A method of producing a lithographic printing plate which comprises:

(a) pumice graining the smooth surface of an aluminum sheet; utilizing a wet slurry containing about 5.5 percent or more pumice alone or in combination with other abrasive materials

(b) cleaning the surface of the resulting pumice grained aluminum sheet;

(c) electrolytically graining said aluminum surface in an aqueous electrolyte whose solute consists essentially of hydrochloric acid, nitric acid, or combinations thereof at a time period of from about 0.15 to 2 minutes per square foot of aluminum surface being treated and at an alternating current density of from 2 to 100 amps per square decimeter wherein the electrolyte is maintained at from about 20 to 80 degrees C.;

(d) rinsing said aluminum sheets with water;

(e) drying said aluminum sheet; and

(f) coating said aluminum sheet with a lithographically suitable photosensitive composition.

4,477,318

TRIVALENT CHROMIUM ELECTROLYTE AND PROCESS EMPLOYING METAL ION REDUCING AGENTS

Thaddeus W. Tomaszewski, Dearborn, Mich., assignor to OMI International Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 205,406, Nov. 10, 1980, Pat. No. 4,392,922. This application May 12, 1983, Ser. No. 492,303

Int. Cl.³ C25D *3/06*

U.S. Cl. 204—51 **20 Claims**

1. An aqueous acidic trivalent chromium electrolyte containing trivalent chromium ions, a complexing agent for maintaining the trivalent chromium ions in solution, halide ions, ammonium ions, hydrogen ions to provide a pH on the acid side, and a reducing agent comprising a metal ion selected from the group consisting of Gold, Silver, Platinum, Palladium, Rhodium, Iridium, Osmium, Ruthenium, Rhenium, Gallium, Germanium, Indium, Samarium, Europium, Gadolinium, Terbium, Dysprosium, Holmium, Erbium, Thulium, Ytterbium, Lutetium, Praseodymium and mixtures thereof present in an amount effective to maintain the concentration of hexavalent chromium ions at a level at which satisfactory chromium electrodeposits are obtained.

4,477,319

PROCESS FOR FORMING A FERRITE FILM

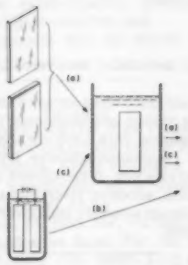
Masanori Abe, Tokyo, and Yutaka Tamaura, Yokohama, both of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha and Mitsubishi Chemical Industries Ltd., both of Tokyo, Japan

Filed Dec. 8, 1983, Ser. No. 559,369

Claims priority, application Japan, Dec. 15, 1982, 57-219741

Int. Cl.³ C25D *11/02*

U.S. Cl. 204—56 R **7 Claims**



1. A process for forming a ferrite film, which is characterized in that in an aqueous solution containing at least ferrous ions as metal ions, ferrous hydroxide ions $FeOH^+$, or $FeOH^+$ and other metal hydroxide ions, are uniformly adsorbed on the surface of a solid by an interfacial reaction at an interfacial boundary between the solid and the aqueous solution; and the adsorbed $FeOH^+$ is oxidized to $FeOH^{2+}$, whereupon $FeOH^{2+}$ and metal hydroxide ions in the aqueous solution undergo a ferrite crystallization reaction to deposit a ferrite layer on the surface of the solid.

4,477,320

METHOD OF PREPARING ELECTROLYTIC MANGANESE DIOXIDE

Olen L. Riggs, Jr., Bethany, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Feb. 27, 1984, Ser. No. 583,779

Int. Cl.³ C25B *1/00*

U.S. Cl. 204—96 **4 Claims**

1. In a method for preparing manganese dioxide by electrolysis of an aqueous solution containing sulfuric acid and manganese sulfate, the improvement which comprises using as a cathode, copper comprised of at least about 99.95 weight percent of copper, from about 0.001 to about 0.085 weight percent of silver and up to about 0.003 weight percent of phosphorous, the weight ratio of phosphorous to silver in said copper being no more than about 2.0 to 1.0, said cathode having a reduced tendency to corrode and undergo build-up of current inhibiting scale.

4,477,321

SACRIFICIAL REINFORCEMENTS IN CATION EXCHANGE MEMBRANE

Thomas C. Bissot, Newark, Del., and Raimund H. Silva, Winsen, Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 225,651, Jan. 16, 1981, abandoned. This application Jan. 15, 1982, Ser. No. 339,467

Int. Cl.³ C25B *1/34, 1/02, 13/02, 13/08*

U.S. Cl. 204—98 **16 Claims**

1. In a process for the continous production of alkali metal hydroxide which comprises continuously providing an aque-

ous alkali metal halide solution to the anode compartment of an electrolytic cell having an anode, a cathode, and a cation exchange membrane separating the anode and the cathode; electrolyzing the solution; and continuously removing alkali metal hydroxide solution, hydrogen, and halogen from the electrolytic cell, the improvement wherein the cation exchange membrane consists essentially of: (a) at least one layer of fluorinated polymer having side chains containing sulfonyl and/or carboxyl groups and (b) a reinforcing web embedded in the fluorinated polymer layer, wherein the entire reinforcing web is degradable by hypochlorite.

4,477,322

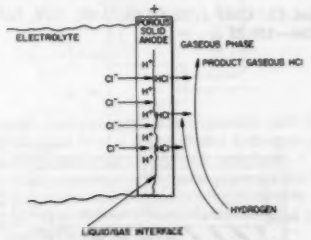
PROCESS FOR PRODUCING HYDROGEN CHLORIDE

Peter C. Foller, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 31, 1983, Ser. No. 499,135

Int. Cl.³ C25B *1/22*

U.S. Cl. 204—103 **3 Claims**



1. An improved process for the production of hydrogen chloride in an electrolytic cell containing a chloride-containing liquid electrolyte and a hydrogen-consuming, hydrogen ion-producing gas anode, said gas anode having a gaseous side which is in contact with said hydrogen and a liquid side which is in contact with said electrolyte, the improvement comprising utilizing an anode which is selectively permeable to the movement of chloride ions from said electrolyte into said anode and substantially impermeable to the movement of hydrogen chloride into said electrolyte, whereby chloride ions react with hydrogen ions in said anode and gaseous hydrogen chloride is liberated from the gaseous side of said anode, said anode being made selectively permeable by the incorporation of amino ($-NH_2$) groups in said anode.

4,477,323

METHOD FOR RECOVERING ZINC FROM A SULFIDIC ZINC SOURCE

Mohammed Esna-Ashari, Bergisch Gladbach, and Hermann Hilbrans, Langenfeld, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Nov. 8, 1983, Ser. No. 549,740

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241740

Int. Cl.³ C25C *1/16*

U.S. Cl. 204—119 **11 Claims**

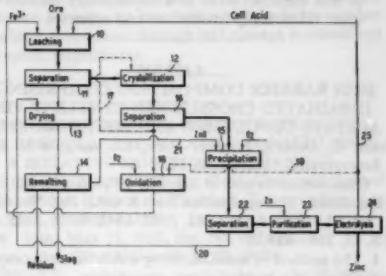
1. In a method for processing a sulfidic zinc source which includes the steps of leaching said source with an electrolysis cell acid, separating the leaching product into liquor and a primary leaching residue, drying said primary leaching residue in a drying stage, melting the dried leaching residue to produce a residue and a zinc oxide containing exhaust gas, the improvement which comprises the steps of:

crystallizing out Fe^{2+} from said liquor as a hydrate, $FeSO_4 \cdot xH_2O$ in a crystallization stage,

separating the filtrate from said crystallization stage in a first separation stage to produce a filtrate and a residue,

neutralizing and oxidizing the separated filtrate to precipitate the remaining Fe^{2+},

separating the filtrate from the precipitation stage in a second separation stage, and



purifying the separated filtrate from the second separation stage to electrolysis purity wherein the concentration of Fe ions is not in excess of 10 mg/l.

4,477,324

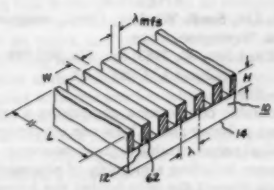
MAKING METAL EUTECTIC FINE WIRE ARRAYS

Harvey E. Cline, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 13, 1981, Ser. No. 320,995

Int. Cl.³ C25F *3/00*; B44C *1/22*; B23K *1/04*

U.S. Cl. 204—129.1 **15 Claims**



1. A method of making arrays of fine metallic wires comprising the process steps of:

(a) depositing sequentially the components of a binary metallic eutectic alloy system as two overlying thin planar layers on a substrate to form a preform, the thicknesses of said layers being determined in accordance with the formula:

$$\frac{t_1}{t_2} = \frac{\rho_2 W_1}{\rho_1(1 - W_1)}$$

where W_1 equals the weight percent of the first component of said eutectic, ρ_1 and ρ_2 equal the density of the first and second components of said eutectic, respectively, and t_1 and t_2 equal the thicknesses of the layers of the first and second components, respectively;

(b) creating a molten zone of said components, said molten zone extending longitudinally in a direction parallel to the plane of said substrate and extending vertically through said planar layers and being contiguous with at least a portion of said substrate;

(c) moving said molten zone across at least a portion of said preform at a substantially uniform rate in a direction perpendicular to said longitudinal direction thereby melting said components of said metallic eutectic alloy at the leading edge of said zone, mixing said components in said zone, and freezing said components at the trailing edge of

said zone, forming thereby a eutectic thin film of the eutectic composition of said components, said thin film having an aligned lamellar structure of two phases, the thickness of said thin film being equal to or less than about 4 microns; and

(d) selectively removing one of said phases to form an array of fine metallic wires in a substantially parallel spaced-apart relationship situated on said substrate.

4,477,325

SKIN BARRIER COMPOSITION COMPRISING AN IRRADIATED CROSSLINKED ETHYLENE-VINYL ACETATE COPOLYMER AND POLYISOBUTYLENE

Frank G. Osburn, Hanover Park, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Continuation-in-part of Ser. No. 397,184, Jul. 12, 1982, abandoned. This application Nov. 8, 1983, Ser. No. 550,020

Int. Cl.³ C08F *8/00*; C08L *1/00*; A61K *9/70*; A61F *5/44*

U.S. Cl. 204—159.12 **9 Claims**

1. The method of manufacturing a skin barrier composition, in the form of a molded shape, comprising:

(a) preparing a homogeneous solid phase mixture by mixing as solid ingredients an uncrosslinked elastomeric copolymer of ethylene and vinyl acetate (EVA) with polyisobutylene, and at least one water-absorbing particulate hydrocolloid or polymer;

(b) forming said mixture into molded shapes applicable to the skin; and

(c) subjecting said molded shapes to form 0.2 to 8.0 megarads of gamma irradiation to crosslink the EVA polymer.

4,477,326

POLYPHOTOINITIATORS AND COMPOSITIONS THEREOF

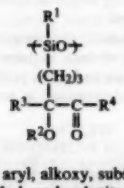
Samuel Q. S. Lin, South Windsor, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed Jun. 20, 1983, Ser. No. 505,588

Int. Cl.³ C08F *2/46*

U.S. Cl. 204—159.13 **7 Claims**

1. A UV curable composition comprising a mixture of an organosiloxane polymer and at least one ethylenically unsaturated free radical polymerizable organic monomer, the organosiloxane polymer including a plurality of photoinitiating units along the chain thereof the units having the formula:



wherein R^1 is alkyl, aryl, alkoxy, substituted alkyl or substituted aryl; R^2 is alkyl, aryl, substituted alkyl or substituted aryl; and R^3 and R^4 are phenyl or substituted phenyl.

4,477,327

DISCOLORATION RESISTANT, FLEXIBLE, RADIATION CURABLE COATING COMPOSITIONS

Joseph C. Cassatta, Taylor; David L. Garrett, Jr., Southfield, and Henk van Oene, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 19, 1982, Ser. No. 369,943

Int. Cl.³ C08G *18/00*

U.S. Cl. 204—159.15 **19 Claims**

1. A coating composition polymerizable by low dosage ionizing radiation, which comprises an organic resin/monomer mixture of:

(A) between about 97 and about 3 weight percent alpha-beta olefinically unsaturated organic resin containing between about 0.5 and about 5 vinyl unsaturation units per 1000 units molecular weight of said resin, and

(B) between about 3 and about 97 weight percent vinyl monomers polymerizable with said resin upon exposure to radiation.

characterized in that said vinyl monomers include N-vinyl-2-pyrrolidone in an amount of from about 3 up to about 10 weight percent based on the total weight of (A) and (B) and that said coating composition is resistant to discoloration in an acid environment.

4,477,328

OPTICALLY READABLE INFORMATION DISK AND METHOD OF MANUFACTURING SAME

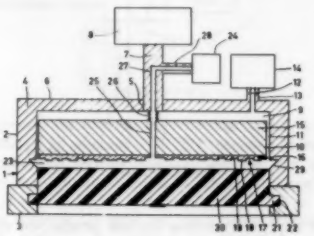
Egbert Broeksema, and Arnoldus A. Smeets, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 102,203, Dec. 10, 1979, abandoned. This application Mar. 4, 1982, Ser. No. 354,830

Claims priority, application Netherlands, May 25, 1979, 7904113

Int. Cl.³ C08F *2/50*; G11B *23/00, 7/26, 7/24*

U.S. Cl. 204—159.23 **7 Claims**



1. A self supported optically readable information disk of radiation cured synthetic resin having a thickness of about 0.5–3 mm the surface of which disk comprises an optically readable information track having a relief structure of information areas situated alternatively at a higher and lower level and which disk is formed by the irradiation of a radiation curable liquid composition having a viscosity of 1000–15,000 cP and comprising oligomeric acrylates or methacrylates which on the average per molecule comprise between one to four acrylate or methacrylate groups and a photoinitiator in a concentration of 0.1 to 0.5 percent by weight.

4,477,329

APPARATUS FOR MAINTAINING PEROXIDE CONCENTRATION

Alisa K. Rogers, Granada Hills, and Kenneth E. Weber, Pacific Palisades, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Division of Ser. No. 346,168, Feb. 5, 1982,. This application Aug. 20, 1982, Ser. No. 410,183

Int. Cl.³ G01N *27/46*

U.S. Cl. 137—93 **3 Claims**

1. An automated system for maintaining the concentration of hydrogen peroxide within an alkaline peroxide treatment solution at a value in excess of a predetermined lower limit, said system comprising:

a treatment tank;

a treatment solution contained within said treatment tank;

means for agitating said solution within said treatment tank so as to ensure that said solution is relatively homogeneous both with respect to chemical composition and with respect to physical properties;

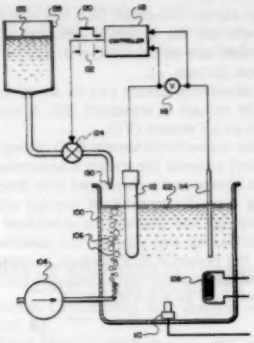
a first electrode;

a second electrode consisting essentially of pure magnesium

metal, said first and second electrodes both being at least partially immersed into said treatment solution within said treatment tank;

a reservoir containing concentrated hydrogen peroxide solution;

a remotely controllable valve operatively interposed be-



tween said reservoir and said treatment tank so as to control the flow of said concentrated hydrogen peroxide solution from said reservoir to said tank; and

circuit means for monitoring the voltage across said first and second electrodes and for generating a control pulse to open said valve as said voltage decreases to a predetermined lower threshold voltage.

4,477,330

ELECTROCHEMICAL ELECTRODE DEVICE

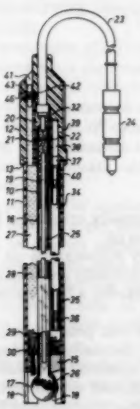
Povl H. Nielsen, Bronshoj, Denmark, assignor to Radiometer A/S, Bronshoj, Denmark

Filed Sep. 28, 1982, Ser. No. 426,178

Claims priority, application Denmark, Oct. 1, 1981, 4363/81

Int. Cl.³ G01N *27/26*

U.S. Cl. 204—414 **14 Claims**



1. An electrochemical electrode device comprising a tubular member having a bottom end and an upper end, a sealing means substantially sealing the bottom end of the tubular member, a cap member closing the upper end of the tubular member so as to define an inner space therein for containing a liquid or a gel, said cap member having a passage connecting the inner space of the tubular member with the outside atmosphere, said passage having an inner end opening and an outer end opening said outer end opening being located in the upper surface part of the cap member, and a closure member being received in a cavity defined in the cap member and intersecting the passage therein at a point between the inner end opening and the outer end opening of the passage, the closure member being selectively movable between open and closed positions, whereby communication between the inner space of the tubular member and the ambient atmosphere through said passage is established and interrupted, respectively.

4,477,331

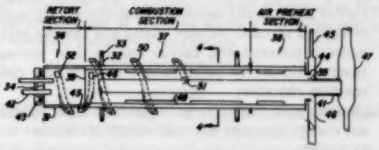
METHOD FOR RETORTING PARTICULATE SOLIDS HAVING RECOVERABLE VOLATILE CONSTITUENTS IN A ROTATING HORIZONTAL CHAMBER

Leland M. Reed, Loveland; William A. Reed, Cincinnati, both of Ohio, and Walter C. Saeman, Cleveland, Tenn., assignors to PEDCo, Inc., Cincinnati, Ohio

Filed May 17, 1983, Ser. No. 495,423

Int. Cl.³ C10G *1/00*; C10B *53/06*

U.S. Cl. 208—8 R **31 Claims**



1. A method for retorting a feedstock of particulate solids having recoverable volatile hydrocarbon constitutents comprising

introducing said feedstock solids into an elongated chamber rotating about a substantially horizontal axis having an inlet and an outlet, said chamber having at the upstream end a retorting section and a physically separate combustion section at the downstream end, said sections in horizontal series with one another with said feedstock enetering at said upstream end,

passing said feedstock solids and recycled, hot, spent solids through said retorting section to provide retorted solids and volatilized hydrocarbons,

recovering said volatilized hydrocarbons free of combustion section products,

introducing said retorted solids into said combustion section,

combusting said retorted solids by lifting and cascading said retorted solids through a moving stream of combustion supporting gas to form said hot, spent solids, and,

recycling a portion of said hot spent solids upstream to said retorting section.

23. A continuous method for retorting a feedstock of particulate solids having recoverable volatile hydrocarbon constitutents comprising

introducing said feedstock solids into an elongated chamber rotating about a substantially horizontal axis having an inlet and an outlet, said chamber having at the upstream end a retorting section, a physically separate combustion section at the downstream end, and a solids cooler/air preheater section connecting with said combustion section, said sections in horizontal series with one another with said feedstock entering at said upstream end,

passing said feedstock solids and a recycled portion of hot, spent solids through said retorting section to provide retorted solids and volatized hydrocarbons

recovering said volatilized hydrocarbons free of combustion section products,

introducing said retorted solid into said combustion section,

combusting said retorded solids by lifting and cascading retorted solids through a moving stream of

preheated air to form hot, spent solid, separating said hot, spent solids to form said recycled portion of hot, spent solids and a remaining portion of hot, spent solids,

passing said remaining portion of hot spent solids to said

solids cooler/air preheater section where combustion air at ambient temperature is heated in countercurrent flow to said solids thus forming said preheated air stream introduced into the combustion section, and

removing cooled, spent solids from said downstream end of said elongated chamber.

4,477,332

SOLUBILIZATION OF CARBONACEOUS MATERIAL

David B. Stickler, Carlisle, Mass., assignor to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Jul. 25, 1983, Ser. No. 516,519
Int. Cl.³ C10G *1/00*; C10B *43/00*
U.S. Cl. 208—8 R **13 Claims**

1. A method of treating particulate carbonaceous material to produce a soluble organic fraction comprising:

(a) dispersing particulate carbonaceous material substantially uniformly throughout a carrier gas substantially transparent to radiant energy;

(b) introducing said particulate carbonaceous material and carrier gas into and substantially uniformly throughout an elongated thermal radiator cavity and causing said carbonaceous material and carrier gas to flow through said cavity, said cavity comprising a reactor tube defining a reaction chamber;

(c) heating said reactor tube to generate high intensity radiant energy directed into said reaction chamber sufficient to rapidly, selectively increase the temperature of said particulate material to volatilize volatile constituents of said particulate material; and

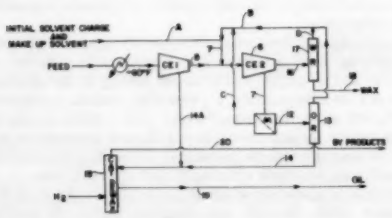
(d) producing said volatilization of said particulate material while heating said carrier gas to a temperature sufficiently less than that of said material whereby substantially all of said volatilized constituents are rapidly cooled upon leaving the particulate material whereby significant further chemical reactions and decomposition is prevented while said volatilized constituents are resident in said reactor tube.

4,477,333

DEWAXING BY A COMBINATION CENTRIFUGE/CATALYTIC PROCESS INCLUDING SOLVENT DEOILING

Mahmoud M. Hafez, Sarnia, Canada, assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 426,709, Sep. 29, 1982, abandoned. This application Nov. 17, 1983, Ser. No. 552,701
Int. Cl.³ C10G *73/02, 73/06, 73/28*
U.S. Cl. 208—30 **8 Claims**



1. A hydrocarbon dewaxing process comprising the steps of:

(a) chilling the waxy hydrocarbon feed to be dewaxed in the absence of solvent to crystallize a portion of the hard wax;

(b) introducing the hydrocarbon feed to be dewaxed into a centrifuge;

(c) centrifuging the solvent free hydrocarbon feed thereby generating two streams, stream (I) comprising a major portion of oil with a minor portion of entrained wax, stream (II) comprising a major portion of wax with a minor portion of entrained oil;

(d) adding a dewaxing solvent to stream (II) generating a slurry A;

(e) feeding slurry A to a centrifuge thereby separating slurry A into an oil-solvent stream (III) and a wax-solvent stream (IV);

(f) passing the oil-solvent stream (III) to a membrane separation unit wherein the stream is separated into a recycle solvent stream and an oil-solvent stream of reduced solvent content (stream V);

(g) passing oil-solvent stream (V) to an oil recovery unit wherein the stream is separated into a recycle solvent stream and an oil stream (VI);

(h) passing the wax-solvent stream (IV) of step (e) to a wax recovery unit wherein the stream is separated into a recycle solvent stream and a recovered wax product stream;

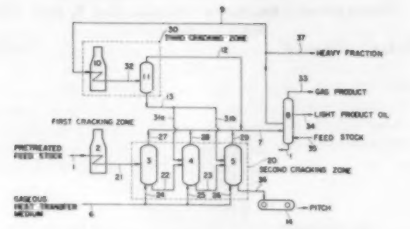
(i) combining wax-oil stream (I) of step (c) with oil stream (VI) of step (g) and passing the combined stream to a catalytic dewaxing unit wherein the combined waxy oil stream, in the presence of hydrogen, is contacted with a catalyst and has its wax content reduced, thereby generating a dewaxed oil product stream.

4,477,334

THERMAL CRACKING OF HEAVY HYDROCARBON OILS

Shimpei Gomi, Tokyo; Tomomitsu Takeuchi, Yokohama; Itaru Matsuo, Matsudo; Masaki Fujii, Chiba; Toru Takatsuka, Yokohama, and Ryuzo Watari, Yamato, all of Japan, assignors to Fuji Oil Co., Ltd.; Fuji Standard Research Inc. and Chiyoda Chemical Engineering & Construction Co., Ltd., all of, Japan

Filed Feb. 24, 1984, Ser. No. 583,183
Claims priority, application Japan, Feb. 28, 1983, 58-32569
Int. Cl.³ C10G *51/02, 9/14*
U.S. Cl. 208—75 **15 Claims**



1. A process for thermally cracking a heavy hydrocarbon oil, comprising the steps of:

(a) feeding the heavy hydrocarbon oil into a first thermal cracking zone for thermally cracking the heavy hydrocarbon oil and for obtaining a first, thermally cracked product;

(b) introducing said first product into a second thermal cracking zone for thermally cracking said first product and for obtaining a second, thermally cracked product and a pitch product, said second cracking zone having a plurality of cracking reactors which are connected in series, through which is successively passed said first product and to each of which is supplied a gaseous heat transfer medium to maintain the liquid phase therein, including said first product, at a temperature sufficient for effecting the thermal cracking and to strip the resulting distillable, cracked components from the liquid phase, the thermal cracking temperature in one reactor being so controlled as to become higher than that in its adjacent upstream-side reactor, the distillable, cracked components in respective reactors being removed overhead therefrom

as said second product, the liquid phase in the downstream-end reactor being discharged therefrom for recovery as said pitch product;

(c) separating said second product into a heavy fraction and a light fraction;

(d) recovering said light fraction as a light product oil;

(e) introducing said heavy fraction into a third thermal cracking zone for thermally cracking same and for obtaining a tar-containing product; and

(f) recycling said tar-containing product to at least one of said reactors of said second thermal cracking zone.

4,477,335

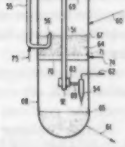
SEPARATION OF REGENERATED CATALYST FROM COMBUSTION PRODUCTS

Roger M. Benslay, Catlettsburg, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed May 17, 1982, Ser. No. 378,578

Int. Cl.³ C10G *11/00*; B01J *37/14*; F27B *15/08*

U.S. Cl. 208—113 **10 Claims**



1. A method for regenerating coke-bearing spent catalyst particles which comprises,

(a) providing a regeneration zone comprising at least an upper catalyst regeneration section separate from a lower bottom regenerated catalyst collection section,

(b) said upper catalyst regeneration section comprising a relatively dense fluid mass of catalyst particles therein being regenerated by combustion of coke with oxygen containing gas charged beneath said bed and passed upwardly therethrough,

(c) passing gaseous products of combustion and particles of catalyst removed from an upper portion of said relatively dense fluid mass of catalyst particles downwardly as a confined stream through an open ended elongated confined transfer zone, the bottom end thereof being displaced above a collected mass of regenerated catalyst particles collected in a bottom portion of said collection section,

(d) withdrawing gaseous products of combustion separated from catalyst particles into an annular zone about the lower bottom open end periphery of said transfer zone,

(e) withdrawing gaseous products from said annular zone by an elongated confined zone communicating with the exterior of said collection section,

(f) replacing regenerated catalyst particles withdrawn from said upper section with coke bearing catalyst particles, and

(g) withdrawing regenerated catalyst particles from collected catalyst in said collection section.

4,477,336

ACID DEALUMINATED Y-ZEOLITE AND CRACKING PROCESS EMPLOYING THE SAME

Julius Scherzer, Anaheim, Calif., assignor to Harshaw/Filtrol Partnership, Oakland, Calif.

Continuation of Ser. No. 354,055, Mar. 2, 1982, abandoned. This application Jul. 11, 1983, Ser. No. 512,320

Int. Cl.³ C10G *11/05, 47/20*

U.S. Cl. 208—120 **4 Claims**

1. In the process of catalytically cracking hydrocarbons undercracking conditions in the presence of a zeolite-containing catalyst, the improvement which comprises employing for the catalytic cracking of hydrocarbons a zeolite composition consisting of a mixture of dealuminated, rare earth metal exchanged Y-zeolites and nondealuminated rare earth metal exchanged Y-zeolites and a matrix, wherein the catalyst composition contains about 30% by weight of Y-zeolite mixture, calculated on the volatile free basis and wherein the quantity of the dealuminated Y-zeolite incorporated in the mixture is in the range of about 10% by weight to about 99% by weight, the dealuminated Y-zeolite being characterized by a total silica-to-alumina (SiO_2/Al_2O_3) molar ratio of more than about 6 and not more than about 300, a sodium content, expressed as Na_2O on a volatile-free basis of less than about 0.5% by weight and an a_o of less than about 24.4 Angstroms.

4,477,337

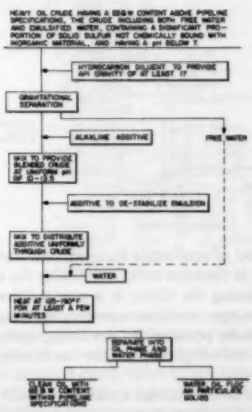
METHOD FOR REMOVING SOLIDS AND WATER FROM PETROLEUM CRUDES

Clifford P. Ronden, Edmonton, Canada, and Donald C. Boylance, Potomac, Md., assignors to Husky Oil Operations Ltd., Calgary, Canada

Continuation of Ser. No. 397,935, Jul. 13, 1982, abandoned. This application Aug. 12, 1983, Ser. No. 522,651

Int. Cl.³ C10G *33/04*

U.S. Cl. 208—188 **10 Claims**



1. The method for reducing to pipeline specifications the BS&W content of a heavy crude oil having a substantial water content comprising both free water and water present as the disperse phase of a stable water-in-oil emulsion as well as a significant content of finely particulate inorganic solids with a significant portion of the solids content being inorganic sulfur which is soluble in toluene but not in heptane and which is of a particle size not substantially exceeding 1 micron, comprising

blending the crude oil with a liquid hydrocarbon diluent in an amount producing a blended crude oil having an API gravity of at least 17;

adjusting the pH of the blended crude to at least 8;

providing in uniform distribution through the blended crude oil while the pH of the blended crude oil is at least 8 a

small proportion of at least one additive selected from the group consisting of alkali metal, alkaline earth metal and ammonium hydrosulfites, hydrosulfides and monosulfides, the amount of the at least one additive being in the range of from a few hundredths of a percent to several percent of the weight of the blended crude;

heating the blended crude oil at 52°–88° C. (125°–190° F.) for at least a few minutes;

then separating the treated crude into at least an oil phase and a water phase; and

recovering the oil phase as a clean blended crude oil having a BS&W content within pipeline specifications.

4,477,338

METHOD AND APPARATUS FOR PROCESSING HIGH-ASH COAL SLURRIES BY FLOTATION, PARTICULARLY FOR PROCESSING GAS COAL AND OPEN-BURNING COAL WHICH ARE DIFFICULT TO FLOAT

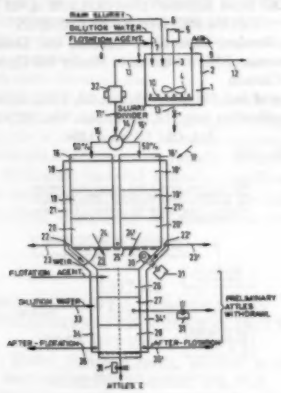
Karl Hellmann, Dorsten, Fed. Rep. of Germany, assignor to Ruhrkohle Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 9, 1982, Ser. No. 356,319

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1981, 3108913

Int. Cl.³ B03B *1/00*

U.S. Cl. 209—5 **39 Claims**



1. A method of processing high-ash coal slurry by flotation of the slurry in flotation cells, comprising the steps of:

preconditioning the slurry in a preconditioning tank with floatation agents and air injection, applying motion to the slurry, under pressure, for the disaggregation of the solids or floculent conglomerates due to floculent in the wash water;

flowing the slurry through a plurality of cells in parallel of a flotation apparatus to separate the slurry into froth and tails; and

controlling the dwell time of the slurry as it traverses the cells.

4,477,339

CYCLONE CLASSIFIER

John P. Whaley, 342 Farallone Ave., Fircrest, Wash. 98466, and Carl J. Gaul, c/o Universal Seafoods, Dutch Harbor, Ak. 99692

Filed Aug. 27, 1982, Ser. No. 412,054

Int. Cl.³ B04C *3/00*

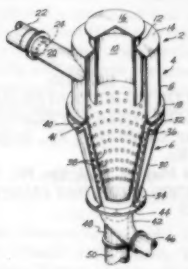
U.S. Cl. 209—22 **13 Claims**

1. A cyclone-type particle classifier which comprises an upper section for forming a particle carrying gas stream into vortical flow and a lower section for classifying the particles;

a. the upper section being of generally cylindrical configuration and having a gas inlet means and an inner, generally cylindrical tub baffle means, the entire top portion of the upper section and tub baffle means being closed;

b. the lower section having coaxial inner and outer portions of inverted, generally frustro-conical shape, the outer portion being solid-walled and the inner portion being foraminous and having a base of essentially the same diameter as the upper section and being mounted thereto in a coaxial end-to-end relationship;

c. the outer solid-walled portion of the lower section having a base of essentially the same diameter as the upper section, but being displaced therefrom to provide an open gap therebetween and create an annular space between



the two portions of the lower section, the outer portion completely enclosing the inner portion except in the area of the gap; the gap being open to the ambient atmosphere outside the classifier;

d. the two portions of the lower section having truncated tips in communication with separate ducts, so that the annular space between the portions communicates with a first duct and the interior volume of the inner portion communicates with a second duct,

e. means for inducing a pressure drop across the classifier so that during use ambient gas is drawn into the gap;

whereby, when in use, the relatively finer particles in the gas stream will pass through the foraminae of the inner portion into the annular space and will be exhausted through the first duct and the relatively coarser particles will be retained within the portion and be exhausted through the second duct.

4,477,340

FROTH FLOTATION METHOD FOR RECOVERING METAL VALUES WITH DIHYDROXY OLEIC ACID

Vojislav Petrovich, 1935, W. Schiller St., Chicago, Ill. 60622

Continuation-in-part of Ser. No. 241,560, Mar. 9, 1981, Pat. No. 4,368,116. This application Sep. 9, 1982, Ser. No. 416,286

Int. Cl.³ B03D *1/14*

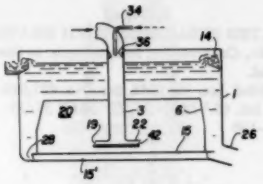
U.S. Cl. 209—166 **1 Claim**

1. In concentrating by froth flotation of metallic ores selected from the group of iron, manganese, tin, titanium, vanadium, and wolfram, which includes the subjecting of said ore material when finely ground to froth flotation process in the presence of dihydroxyoleic acid or its potassium salt, and in the presence of sulfurous acid; the step of adding to the mineral slurry an amount of the order from 0.01 to 0.1 kg per ton of ore treated of said dihydroxyoleic acid, and an amount of the order from 0.02 to 0.2 kg per ton of ore treated of sulfurous acid; said additions to aqueous dispersion of ore produce a floating froth product of said mineral value by continous agitation and aeration of the aqueous dispersion of ore, and separating and recovering the iron, manganese, tin, titanium, vanadium, wolfram mineral value as float froth concentrate product.

4,477,341
INJECTOR APPARATUS HAVING A CONSTRICTION IN A FOLLOWING ADJOINING MIXING PIPE

Peter Schweim, Elchingen, and Hans-Dieter Dorfiinger, Heidenheim, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Nov. 4, 1982, Ser. No. 439,029
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1981, 3144386
Int. Cl.³ B03D 1/24
U.S. Cl. 209—170 22 Claims

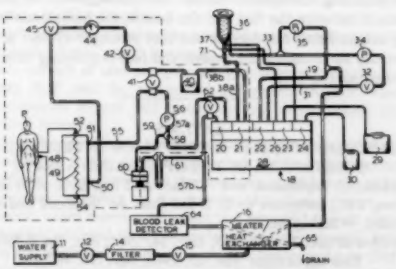


1. An injector apparatus for a flotation tank, comprising:
a stationary mixing pipe for aerating suspensions for the flotation of solid matter contained therein and having therein a mixing section and a constricted opening at the beginning of said mixing section, said constricted opening terminating in the direction of flow in an abruptly diverging radially outward manner toward said mixing pipe, said mixing pipe having its outlet end portion diverging radially outwardly similar to a radial diffusor, and
an air supply line means being substantially concentrically disposed in said constricted opening and having its outlet end opening disposed a short distance after said constricted opening in the direction of flow.

4,477,342
APPARATUS AND METHOD FOR CONTROLLING ULTRAFILTRATION DURING HEMODIALYSIS

Jonathan M. Allan, Portland; Richard J. Burton, Tigard, both of Oreg., and Volker Jurock, Rodgau, Fed. Rep. of Germany, assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed Aug. 31, 1982, Ser. No. 413,287
Int. Cl.³ B01D 31/00
U.S. Cl. 210—87 11 Claims

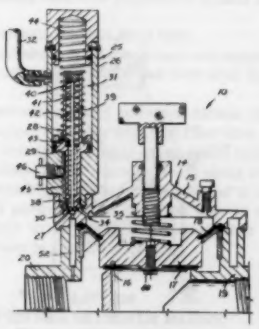


1. An apparatus for controlling ultrafiltration during hemodialysis having below mean dialyzer blood pressure and above atmospheric pressure sections, said below mean dialyzer blood pressure section comprising:
a fresh dialysate supply line and a first portion of a spent dialysate removal line;
a pair of matched positive displacement units each including valves and interrelated switching means, the first of said units being interconnected to said supply line by a mix point and pressure reducing means; and
a hemodialyzer for the dialysis and ultrafiltration of blood including inlet and outlet blood ports, an inlet dialysate port for the entry of fresh dialysate and an outlet dialysate port for the exit of spent dialysate; said above atmospheric pressure section comprising:
a second portion of the spent dialysate removal line interconnected to said first portion of said spent dialysate removal line by pressure increasing means;
the second of said positive displacement units being in fluid communication with the second portion of said spent dialysate removal line;
a dialysate drain line in fluid communication with the second portion of said dialysate removal line; and
ultrafiltrate removal means connected between the second portion of said spent dialysate line and said drain line adapted to withdraw dialysate from said removal line and transfer same to said drain line;
said valves and switching means adapted to cause concurrently one of said units to fill with fresh dialysate as fresh dialysate is supplied to said dialyzer while the other unit fills with spent dialysate as spent dialysate is drained and to alternate functions after said valves are reversed.

4,477,343
FILTER BACKWASH MEANS

Alfred D. Tucker, Kersbrook, Australia, assignor to Ris Irrigation Systems Pty. Limited, Elizabeth, Australia

Filed Dec. 31, 1981, Ser. No. 336,447
Int. Cl.³ B07B 1/00
U.S. Cl. 210—108 13 Claims



1. Filter backwash means comprising: means designed, sized and arranged for effecting backwash of an irrigation system filter having inlet and outlet pipes, including:
a pressure actuated dump valve have a housing, a valve seat in the housing, a dump valve member co-operable with the valve seat, and pressure actuated means operatively coupled between the dump valve member and housing and controlling opening or closing of the dump valve,
a pressure actuated dump control pilot valve comprising a pilot valve housing, having a pilot valve seat, an inlet pressure zone and an outlet pressure zone within the pilot valve housing, an axially movable valve lifting member having pressure responsive means dividing said zones within the pilot valve housing, and a pilot valve member axially movable within and with respect to the valve lifting member and cooperable with said pilot valve seat,
conduit means in fluid flow communication between said outlet pressure zone and said outlet pipe directing hydraulic pressure derived from said outlet pipe against said valve lifting member pressure response means to urge said valve lifting member in a closing direction of said pilot

valve housing and the valve lifting member also urging the valve lifting member in said closing direction,

further conduit means in fluid flow communication between said inlet pressure zone and said inlet pipe directing hydraulic pressure derived from said inlet pipe against said valve lifting member to urge said valve lifting member in an opening direction of said pilot valve but to urge said pilot valve member in a closing direction, a trigger spring coacting between said valve lifting member and pilot valve member and of such length to be operable to lift said pilot valve member from its pilot valve seat only after initial movement of said valve lifting member in said opening direction,

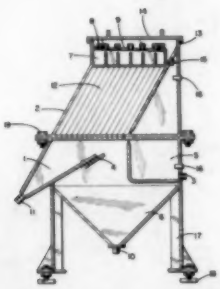
and walls defining a vent aperture extending from said pilot valve seat directing a venting flow of fluid from said inlet pressure zone upon opening of said pilot valve due to increase of differential between the pressures in the inlet and outlet pressure zones, said venting flow so reducing the opening pressure controlling the dump valve that the dump valve again closes.

4,477,344

DEVICE FOR CLARIFICATION OF LIQUIDS AND SEPARATION OF PRECIPITATES

Witold Olszewski; Andrzej Lis; Pawel Pietraszek, and Franciszek S. Tuznik, all of Warsaw, Poland, assignors to Instytut Mechaniki Precyzyjnej, Warsaw, Poland

Filed Nov. 3, 1982, Ser. No. 438,921
Int. Cl.³ B01D *21/00*
U.S. Cl. 210—109 **2 Claims**



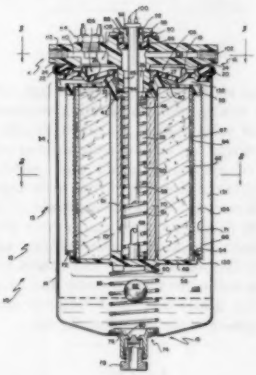
1. In a device for clarification of liquids and separation of precipitate materials, comprising a frame, a contact chamber mounted on said frame having a conical shape widening in the upward direction, a settling tank mounted above said contact chamber and having means for passing multiple streams of fluids therethrough, outflow means mounted above said settling tank for recovery of clarified liquids, a thickening chamber mounted on said frame below said contact chamber, the improvements which are characterized in that said contact chamber is in the shape of an inverted irregular tapered wall chamber in the form of a pyramid, cone, or the like and arranged with an oblique axis inclined relative to the horizontal at an acute angle, the upper inner edge of said contact chamber having mounted thereon an adjustable overflow means to effectively change the base of the oblique shaped contact chamber to vary the capacity thereof, said settling tank having a plurality of laminar sheets arranged in an assembly providing multiple flow paths at an oblique angle relative to the horizontal, said outflow means including an outlet unit having a plurality of outflow chamber elements, each of which includes means for passing several of said multiple streams of liquid flowing from beneath through said settling tank, said outflow elements having in the upper portions thereof a corresponding outlet conduit directed upwardly and mounted in an inclined cover plate mounted above said outlet units, each said outlet conduit having an upper end terminating in a common horizontal plane above said inclined cover plate, and an overflow pocket means situated between said settling tank and said thickening chamber laterally offset from said contact chamber for collection of clarified liquids including level sensing means therein and outflow means provided in said outflow pocket.

4,477,345

FILTER SEPARATOR WITH HEATER

Emil Szlaga, Jr., Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Filed Jan. 10, 1983, Ser. No. 457,010
Int. Cl.³ B01N *27/10*; B01D *35/18*
U.S. Cl. 210—130 **12 Claims**



1. A fuel-processing assembly comprising a housing having a fuel entry port and a fuel exit port, a series of elements disposed in the housing, the elements including a heater for heating the fuel, fuel passageway-defining means disposed coaxially with the heater to define a fuel passageway between the entry port and the exit port, the fuel passageway-defining means at least partially surrounding the heater, turbulence-inducing means for inducing turbulence in the fuel passageway to promote contact between the fuel and the heater, the turbulence-inducing means being disposed in the fuel passageway and at least partially surrounding the heater, and fuel-processing means for processing the fuel.

4,477,346

METHOD FOR THE REMOVAL OF INTERFERING SUBSTANCES IN THEOPHYLLINE ASSAYS

Johanne C. Dickinson, and William A. Frey, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 334,165, Dec. 24, 1981, Pat. No. 4,460,695. This application Apr. 22, 1983, Ser. No. 487,896
Int. Cl.³ B01D *15/00*
U.S. Cl. 210—198.2 **6 Claims**

1. A filled column capable of producing a substantially completely caffeine-free biological sample suitable for the measurement of its theophylline content by liquid-liquid extraction consisting essentially of a packing which is

(A) water-insoluble, hydrophobic, macrorecticular resin having a particle size range of 40–500 μm and a surface area range of 300–400 m^2/g, slurried in

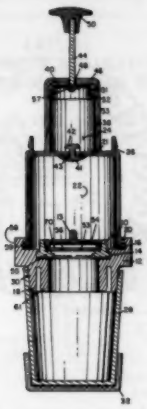
(B) protic solvent.

4,477,347

PORTABLE WATER PURIFIER

Francis W. Sylva, 17 Angie Rd., North Billerica, Mass. 01862

Filed Jun. 21, 1983, Ser. No. 506,449
Int. Cl.³ B01D 27/08; C02F 1/28
U.S. Cl. 210—232 3 Claims



1. A portable water purifier comprising:

a filter housing member with a top and base, having a filter assembly receipt aperture defined therein, said filter having further:

(a) a knurl portion;

(b) a water chamber receipt member at its top perimeter;

(c) a filter housing cup receipt member at its base;

(d) an external water receipt element attachment at its base within the area of said filter housing cup receipt member;

a cylindrical unfiltered water chamber member having a top and bottom, said bottom having an open end defined therein adapted at its open bottom to be releasably attached to said filter housing at said water chamber receipt member;

pump means having a diameter adapted to be smaller than the diameter of said cylindrical unfiltered water chamber, said pump means positioned on the top of said unfiltered water chamber member adapted to pressurize the insides of said unfiltered water chamber, said pump means further including:

a piston;

a pump housing adapted to contain said piston for reciprocating motion thereby;

a shaft member attached to said piston extending to the outside of said pump housing;

means outside of said pump housing to allow the grasping of said shaft and the reciprocal movement thereof which movement moves said piston up and down within said pump housing;

a first valve positioned between said pump housing and said unfiltered water chamber, adapted to close the aperture defined therebetween on the upstroke of said pump and to open said aperture on the downstroke of said pump;

a second valve member adjacent and attached to said piston member adapted to allow air to enter beneath said piston on the upstroke and to close on the downstroke so that a downstroke causes air to enter said unfiltered water chamber while an upstroke scales said unfiltered water chamber so that no air escapes therefrom and which after several pumps of the piston creates an increase of air pressure within said unfiltered water chamber forcing any fluid placed therein through said filter assembly and into said cap member;

a cylindrical cup member having an open end defined therein of a like diameter of the top of said unfiltered water chamber which cup in a storage mode is releasably retained covering said pump means at the top of said unfiltered water chamber forming a continuous contiguous outer surface with said unfiltered water chamber said cup adapted to cover and protect said pump means and which cup member in a use mode is adapted to be removed from the top of said unfiltered water chamber and positioned at the base of said filter housing releasably attached to said filter housing cup receipt member;

a filter assembly adapted to be retained in said filter assembly receipt aperture adapted for water to pass therethrough from said unfiltered water chamber to said cup member upon pressurization of said unfiltered water chamber by said pump means;

a cap member having an open end defined therein which cap member in said storage mode is releasably attached to said filter housing cup receipt member and which in said use mode is removed from said filter housing to allow said cup member to be attached thereto, which cap member can then be retained by releasably attaching it to the end of said cup member said water chamber receipt member defined in said fitler housing is an interlock member defined around the upper perimeter of said filter housing and said unfiltered water chamber further includes around the outer perimeter of its open end a plurality of water chamber projection members adapted to mate with said water chamber receipt member's interlock member being releasably attachable thereto, said unfiltered water chamber further including at least a segment of the perimeter of its upper portion a cup receipt member projection, said cup member also further including around the inner perimeter of its open end a cup retention groove adapted to mate with and be releasable from said cup receipt member projection;

a filter base having interlock projections around its outside perimeter;

support means located in said filter base;

a hydrophilic membrane positioned over said support means;

an activated carbon disk positioned over said hydrophilic membrane;

a filter top sandwiching said activated carbon disk, membrane, and support member with said filter base, said filter top further including means to grasp game; and

said filter assembly further includes means along the sides of said filter assembly receipt aperture adapted to mate with the interlock projections on said filter base to allow said filter assembly to be engaged into said filter assembly receipt aperture in said filter housing.

4,477,348

OPEN SEA SKIMMER BARGE

William M. Ayers, Duncan, Okla.; Ashok K. Maheshwary, and Peter J. Young, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 161,088, Jun. 19, 1980, abandoned.
This application Mar. 15, 1982, Ser. No. 358,392
Int. Cl.³ E02B 15/04
U.S. Cl. 210—242.3 47 Claims

1. A towed open sea oil skimming vessel for skimming oil and the like from the surface of a body of water, said vessel comprising:

a hull having a bow, a bottom, side walls, a stern having a substantially horizontal elongate slot extending across a portion thereof and a deck, said hull including:

spill suction tunnel means communicating with the elongate slot extending across a portion of the stern of said hull and exiting said hull at an exit intermediate the bow and stern thereof, the spill suction tunnel means having an upper wall having a curvilinear shape along an initial portion thereof extending from the elongate slot of said hull to a point intermediate the distance between the elongate slot and the exit of the spill suction tunnel means, the curvilinear shape of the upper wall causing said oil and the like from the surface of said body of water to buoyantly flow therealong in a substantially uninterrupted layer when said vessel is positioned to have the upper wall extending from above the surface of said body of water to below the surface of said body of water;

spill suction pump means located in the spill suction tunnel means for the pumping of the oil and a portion of the water from said body of water thereinto and the pumping of the water therethrough;

collection tank means communicating with the spill suction tunnel means, the collection tank means having movable flap means located in the bottom thereof movable into the spill suction tunnel means to selectively allow communication between the spill suction tunnel means and the collection tank means;

induction space header means communicating with the collection tank means;

induction pump means having the inlet thereof communicating with the induction space header means and the outlet thereof communicating with said body of water, the induction pump means pumping water from the collection tank means to said body of water when said vessel is skimming the oil and the like from said body of water; and

secondary oil separation means contained within the collection tank means

whereby said vessel is moved bow first to said oil and the like on said surface of said body of water and subsequently moved stern first through said oil and the like and a portion of the water from said body of water to flow into the spill suction tunnel means through the slot in the stern of said hull, said oil and the like and the portion of the water from said body of water having the velocity thereof increased after flowing into the spill suction tunnel means by the pumping action of the spill suction pump means, said oil and the like buoyantly flowing along the upper wall of the spill suction tunnel means in a substantially uninterrupted layer, said oil and the like and a portion of the water in the spill suction tunnel means subsequently flowing into the collection tank means by moving the movable flap means in the bottom of the collection tank means into the spill suction tunnel means wherein said oil and the like is subsequently separated in the collection tank means from the portion of the portion of water flowing into the collection tank means, the portion of the portion of water being removed from the collection tank means by being pumped through said induction header means by the induction pump means to said body of water.

4,477,349

METALURIGICAL SLAG FILTERING APPARATUS

Guido Monteyne, Beikenlaan 28, 9971 Lembeke, Belgium

Filed Feb. 10, 1984, Ser. No. 578,817

Claims priority, application Luxembourg, Feb. 10, 1983, 84642

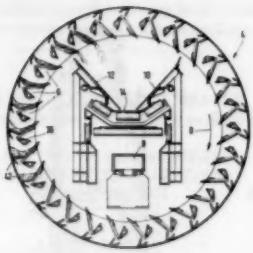
Int. Cl.³ B01D *33/06*

U.S. Cl. 210—297 **14 Claims**

1. A filtration apparatus including a rotary drum, said rotary drum having a foraminous wall along the outside surface thereof and end walls, said rotary drum having a plurality of internal vanes for filtering liquid and solid materials, said filtered solid material being conveyed upwardly and subsequently falling onto a conveyer belt passing longitudinally through the drum, each of said vanes comprising:

retaining blade means extending from said drum;

filtering blade means disposed across from said retaining blade means and separated by an opening therebetween,



said filtering blade means permitting liquid to pass therethrough; and

deflecting means positioned beneath said filtering blade means to prevents said separated filtered water from falling onto the filtered solid material of an adjacent vane.

4,477,350

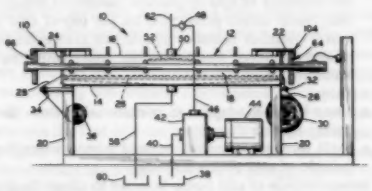
LIQUID FILTERING APPARATUS

Robert H. Brandt, Bowling Green, and Merlin P. Hoodlebrink, Bradner, both of Ohio, assignors to Brandt & Associates, Inc., Bowling Green, Ohio

Filed Mar. 14, 1983, Ser. No. 474,783

Int. Cl.³ B01D *29/04*

U.S. Cl. 210—387 **20 Claims**



1. Filtering apparatus comprising a housing having end openings, means for supporting filter media in said housing between said end openings, a filter supply roll for supplying filter media through one end opening to said filter supporting means, a takeup roll for receiving filter media through the other end opening from said supporting means, means for supplying liquid to be filtered to one side of said filter media supporting means, means for receiving filtered liquid on the other side of said filter media supporting means, a sealing member for each of said end openings, each of said sealing members comprising a backup plate and a resilient layer, a first transverse supporting bar spaced from one of said backup plates, a piston rod connected to one of said supporting bar and said one backup plate, a fluid-operated cylinder receiving said piston rod and connected to the other of said supporting bar and said one backup plate, two spaced connecting bars affixed to spaced portions of said supporting bar and extending along sides of said housing and beyond the other end opening, means for movably supporting said connecting bars at the sides of said

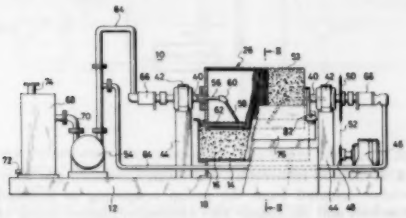
housing, a second transverse supporting bar affixed to the backup plate of the other sealing member and connected to said connecting bars, first stop means for limiting movement of said one sealing member away from the one end opening, a second stop means for limiting movement of said other sealing member away from the other end opening.

4,477,351

FILTERING APPARATUS

Tomio Kobayashi, No. 5-21-9, Tsukagoshi, Warabi-shi, Saitama-ken, Japan

Filed Aug. 24, 1983, Ser. No. 525,975
Int. Cl.³ B01D *33/10*
U.S. Cl. 210—396 **7 Claims**



1. A filtering apparatus for continuously separating a substance such as slurry, sludge or other suspension into a liquid component and a solid component in such manner that the solid component is obtained in a semi-dried condition, said apparatus comprising:

a vessel for receiving the substance to be filtered;

a rotary drum including a cylindrical member having a plurality of grooves defined on its outer peripheral surface and perforations formed in said grooves, and a filter medium provided on the outer surface of said cylindrical member, said drum being supported for rotation so that a portion thereof is immersed into the substance received in said vessel;

said grooves being regularly and closely disposed to form a crest portion between each adjacent pair of grooves and said filter medium being a filter cloth which is stretched tautly across said crest portions whereby the full area of the filter cloth can essentially serve as an effective filter surface;

driving means for rotating said drum;

suction means for reducing the pressure within said drum so that during the rotational movement of said drum the liquid component of said substance is drawn into said drum through the portion thereof which is immersed into said substance while the solid component of said substance continuously accumulates on the filter medium of said rotating drum and is held as a cake thereon, said suction means also causing air to pass into said drum through the portion thereof which is exposed to the atmosphere whereby the solid component held by the drum can be obtained as a cake in a more highly-dried condition, the liquid component and air introduced into said drum being taken out therefrom; and

scraping means for removing said cake held on the filter medium of said drum.

4,477,352

FUEL FILTER

Harry J. Pappas, 1224 Cashman Dr., Las Vegas, Nev. 89102

Filed Mar. 14, 1983, Ser. No. 475,148
Int. Cl.³ B01D *29/14*
U.S. Cl. 210—448 **11 Claims**

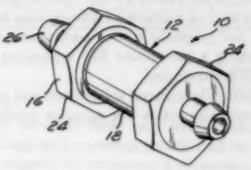
1. An improved fuel filter particularly adapted for use on sport and off-road internal combustion engine vehicles comprising:

a housing formed of a first and second housing segment defining an inlet, an outlet and a filter element chamber disposed between said inlet and outlet;

flange means formed on said housing adjacent to said inlet and outlet for connecting said housing to the fuel line of the internal combustion engine of the vehicle;

a disposable tubular filter element sized to be received within said filter chamber and filter fuel flow between said inlet and outlet; and

means designed, dimensioned, and arranged for providing quick replacement of and assuring a reliable seal for said



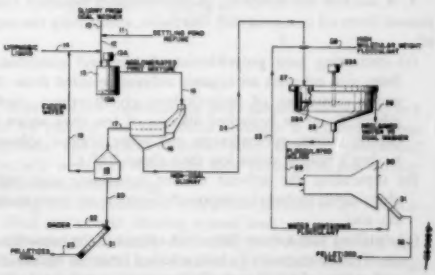
filter element within said filter chamber under extremely dirty and hot conditions of extreme vibration, said means including an annular shoulder formed adjacent said inlet sized to be received within one end of said filter element to securely hold said filter element in a parallel orientation to the axis of said filter chamber and to sealingly engage said filter element to said first housing segment adjacent to said inlet to require fuel flow through said inlet to travel through said filter element prior to flow through said outlet, means for continuously biasing said filter element tightly against said annular shoulder and means for removably mounting said first and second housing segments together.

4,477,353

METHOD OF RECLAIMING WATER AND COAL FROM COAL TREATMENT UNDERFLOW BY TWO-STAGE SEPARATION OF SOLIDS

Leonard Messer, Pittsburgh, Pa., assignor to American Minechem Corporation, Coraopolis, Pa.

Continuation of Ser. No. 115,017, Jan. 24, 1980, abandoned, which is a continuation of Ser. No. 941,055, Sep. 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 608,059, Aug. 27, 1975, abandoned, which is a continuation of Ser. No. 540,348, Jan. 13, 1975, abandoned. This application Sep. 25, 1981, Ser. No. 305,441
Int. Cl.³ B03D *3/00;* **B01D** *21/01*
U.S. Cl. 210—633 **20 Claims**



1. A method of reclaiming water and carbonaceous material from an aqueous slurry of carbonaceous and non-carbonaceous particles in which the slurry is at least 60% water by weight, said method comprising the steps of:

A. adding a fluid to the aqueous slurry of carbonaceous and non-carbonaceous particles to form a first mixture, in which less than 20% of the combined weight of the fluid and the carbonaceous and non-carbonaceous fine particles is fluid, said fluid being a light hydrocarbon such that it is free-flowing and in a liquid state at temperatures below 20° C., and that it is lyophilic to carbonaceous particles and lyophobic to water and non-carbonaceous particles;

B. agitating said first mixture to preferentially agglomerate said carbonaceous particles into discrete agglomerates, while the non-carbonaceous particles remain substantially unagglomerated;

C. separating the discrete agglomerates from said first mixture to form a substantially non-carbonaceous slurry;

D. adding a flocculant to said non-carbonaceous slurry to form a second mixture, said flocculant being lyophobic to water and lyophilic to non-carbonaceous particles;

E. removing a precipitate and separating water from said second mixture; and

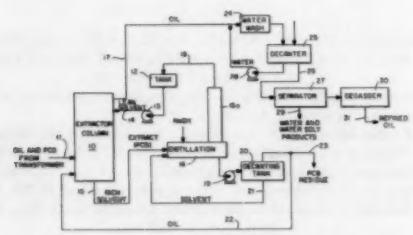
F. separating flocculated solids from said precipitate to form a substantially solids-free aqueous solution.

4,477,354

DESTRUCTION OF POLYCHLORINATED BIPHENYLS DURING SOLVENT DISTILLATION

William A. Fessler, Pittsfield, Me., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Sep. 7, 1982, Ser. No. 415,271
Int. Cl.³ C07C *7/10*
U.S. Cl. 210—634 **8 Claims**



1. A method for removing polychlorinated biphenyl compounds from oil contaminated therewith, comprising the steps of:

(a) extracting said polychlorinated biphenyl compounds from said oil with an organic solvent selected from the group consisting of polyethylene glycol ethers, cyclic ethers, linear or branched alkanes of less than about 12 carbon atoms, cycloalkanes, and polar organic solvents having a boiling point less than about 200° C.,

(b) separating the solvent extract containing said polychlorinated biphenyl compounds from the oil phase in step (a), and

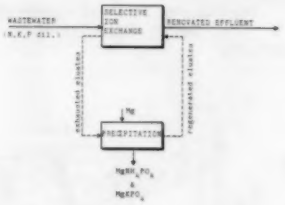
(c) distilling said solvent from said extract in the presence of an effective amount of a base selected from the hydroxides and oxides of alkali and alkaline earth metals to destroy said polychlorinated biphenyl compounds forming a solvent distillate and a distillation residue containing salts and polychlorinated biphenyl decomposition products and collecting the solvent distillate for use in step (a).

4,477,355

METHOD FOR REMOVING AND RECOVERING NUTRIENTS FROM WASTEWATER

Lorenzo Liberti, via Auricarro 113/9; Gianfranco Boari, via Auricarro 113/10, both of 70027 Palo del Colle (BA), and Roberto Passino, via F. Ferrara 8, 00191 Roma, all of Italy

Filed Mar. 30, 1983, Ser. No. 480,526
Claims priority, application Italy, Jan. 14, 1983, 47563 A/83
Int. Cl.³ C02F *1/42*
U.S. Cl. 210—665 **6 Claims**



1. A method for treating wastewater containing at least one member selected from the group consisting of ammonium, potassium and phosphate ions at concentrations below about 15 mmol/l per ion type to recover said ions therefrom, said method comprising:

(a) passing said wastewater through a cation exchange zeolite resin having affinity for the retention of potassium and ammonium ions in preference over calcium and magnesium ions, to selectively extract potassium and ammonium ions present therein;

(b) passing the effluent of step (a) through a strongly basic anion exchange resin having quaternary ammonium functional groups, to selectively extract phosphate ions present therein;

(c) regenerating both said cation exchange resin and said anion exchange resin with neutral aqueous sodium chloride at a concentration of about 0.6 M to produce eluates containing the ions extracted in steps (a) and (b);

(d) combining said eluates;

(e) raising the pH of said combined eluates to a value ranging from about 8.5 to about 9.5 and adding thereto a sufficient quantity of at least one member selected from the group consisting of $MgCl_2$, $MgCO_3$, MgO, $MgSO_4$ and $MgHPO_4$ and to bring the relative amounts of $Mg:NH_4:PO_4$ to approximately 1:1:1 on a molar basis and thereby precipitate $MgNH_4PO_4$ hydrous salt;

(f) recovering a supernatant from step (e), raising the pH thereof to a value ranging from about 9.5 to about 10.5 and adding thereto a sufficient quantity of at least one member selected from the group consisting of $MgCl_2$, $MgCO_3$, MgO, $MgSO_4$ and $MgHPO_4$ to bring the relative amounts of $Mg:K:PO_4$ to approximately 1:1:1 on a molar basis and thereby precipitate $MgKPO_4$ hydrous salt; and

(g) recycling supernatents from both steps (e) and (f) to step (c).

4,477,356

EMULSION SEPARATION METHOD AND APPARATUS

Harlow B. Grow, 16530 Chattanooga Pl., Pacific Palisades, Calif. 90272

Filed Jan. 31, 1979, Ser. No. 7,989
Int. Cl.³ B01D *17/04*
U.S. Cl. 210—741 **24 Claims**

1. A process for separating oil from a water emulsion thereof, and including;

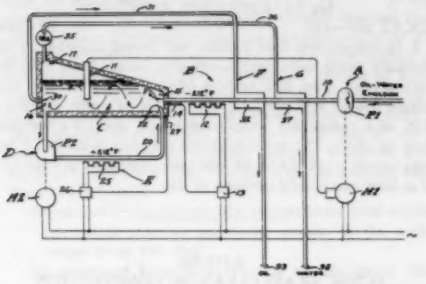
the first step of oil-water emulsion induction,

the second step of preheating the emulsion to a temperature below boiling of the water content in the induction emulsion,

the third step of moving the preheated emulsion progressively through an entirely open separating chamber from an induction end to a discharge end,

the fourth step of recirculating emulsion oil by admixing the same with the progressively moving emulsion by injection thereof into the induction end of the separating chamber,

the fifth step of superheating the recirculating emulsion oil



to a temperature above boiling of the water content in the emulsion moving progressively through the separating chamber,

the sixth step of discharging product oil from the discharge end of the separating chamber, and

the seventh step of discharging by-product steam from the emulsion moving progressively through the separating chamber.

4,477,357

DETOXIFICATION OF SUBSTANCES BY UTILIZATION OF ULTRASONIC ENERGY

Marcus Sittenfield, Laverock, Pa., assignor to Hazardous Waste Management, Inc., Woodbridge, Va.

Filed Sep. 6, 1983, Ser. No. 529,483

Int. Cl.³ B01J *3/08*

U.S. Cl. 210—748 **8 Claims**

1. A method of removing undesirable halogenated aromatic compounds from a liquid or perverulent solid material which comprises applying ultrasonic radiation to said material in the presence of an alkaline agent in admixture with the material, said alkaline agent being present in the mixture in an amount that is at least as great as the halogen equivalent of said material, and said radiation being applied in sufficient amount to cause cavitation in the mixture.

4,477,358

PRESSURE/BELT FILTER, PARTICULARLY FOR DEWATERING FINE COAL

Siegfried Heintges, Haltern; Werner Strauss, Bochum, and Hannes S. Horn, Dortmund, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Mar. 11, 1983, Ser. No. 474,525

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208735; Jan. 25, 1983, 3302326; Feb. 24, 1983, 3306362

Int. Cl.³ B01D *33/02*

U.S. Cl. 210—783 **21 Claims**

1. The method of dewatering fine coal or the like comprising the steps of:

supporting a belt horizontally with a noncompressible structure within a closed cylindrical chamber;

placing a suspension of material on the horizontal surface of the belt;

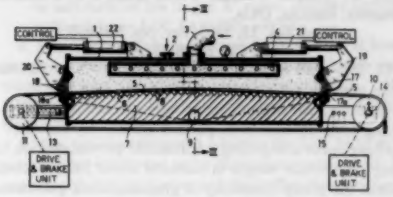
pressurizing the upper surface of the belt to force filtrate through the belt while simultaneously admitting an equal fluid pressure beneath the belt to balance the forces thereon;

and intermittently opening the chamber and moving the belt out of the chamber to carry filter material out of the chamber.

2. A pressure belt filter for dewatering fine coal or the like comprising in combination:

a horizontal cylindrical housing defining an upper pressure chamber and a lower support space therein and including a pair of ends, each of said ends including an opening therein;

a noncompressible support mounted in said support space;



an intermittently movable filter belt within the chamber extending through said openings and carried on said noncompressible support for receiving a suspension of material to be filtered with fluid pressure applied to the upper surface of the material on the belt and filtrate removed from below the belt;

and movable sealing devices positioned at said openings to said chamber so that the sealing devices may be moved from the openings to move the filtered material out of the chamber.

4,477,359

PROCESS FOR FRACTIONATING SOLID PARTICLES SUSPENDED IN A LIQUID, IN PARTICULAR FOR TREATING PAPER-INDUSTRY FIBER SUSPENSIONS

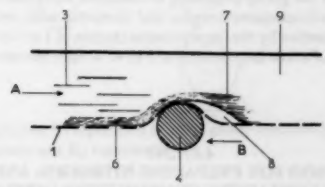
Bernard Perrin, Grenoble; Bernard Bianchin, Seyssinet, and Georges Sauret, Grenoble, all of France, assignors to Centre Technique de L'Industrie des Papiers, Cartons et Celluloses, Grenoble, France

Filed Jul. 20, 1981, Ser. No. 284,823

Claims priority, application France, Jul. 25, 1980, 80 16756; European Pat. Off., Jul. 8, 1981, 81420103.4

Int. Cl.³ B01D *35/20*

U.S. Cl. 210—785 **1 Claim**



1. A process for fractionating solid particles suspended in a liquid by passing the suspension through a filtering screen comprising an elastically deformable, flexible, perforated sleeve with a layer of suspended solid particles on one surface of said sleeve, comprising:

moving said suspension in a direction parallel to the longitudinal axis of said filtering screen; and

locally and substantially deforming said sleeve toward said layer of particles and translating the deformation along the screen, thereby creating before and after said deformation, high and low pressure regions respectively which travel along said sleeve for detaching said particles from said sleeve, the said deformation of said sleeve being

generated and said high and low pressure region being created by moving along the generatrix of said sleeve, in a direction opposite to the direction of flow of said suspension, an element disposed outside said sleeve.

4,477,360

METHOD AND COMPOSITIONS FOR FRACTURING SUBTERRANEAN FORMATIONS

Stephen W. Almond, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 13, 1983, Ser. No. 504,033
Int. Cl.³ E21B *43/26*
U.S. Cl. 252—8.55 R **20 Claims**

1. An aqueous gel comprising:

an aqueous fluid comprising a water-alcohol solution having from about 0 to 80 percent alcohol by volume;

a gelling agent comprising a solvatable polysaccharide having a molecular weight in excess of about 100,000 selected from the group consisting of glucomannans, galactomannans, and derivatives thereof, said gelling agent being present in an amount of from about 0.2 to about 1.25 percent by weight of said aqueous fluid, and

a retarded crosslinking composition soluble in said aqueous fluid comprising a zirconium IV salt or chelate and a polyhydroxyl-containing compound having from about 3 to about 7 carbon atoms, the volumetric ratio of said zirconium IV salt or chelate to said polyhydroxyl-containing compound being in the range of 0.01:1 to about 100:1, said zirconium IV salt or chelate being present in an amount of at least about 0.0005 percent by weight of said aqueous gel.

4,477,361

ANTIFUNGAL-ANTIBACTERIAL DETERGENTS CONTAINING CINNAMIC COMPOUNDS

George S. Sperti, and Boris Sway, both of Cincinnati, Ohio, assignors to Sperti Drug Products, Inc., Erlanger, Ky.

Filed Feb. 22, 1983, Ser. No. 468,346
Int. Cl.³ C11D *9/50, 3/48*
U.S. Cl. 252—106 **7 Claims**

1. An antimicrobial surfactant in the form of a fatty acid soap rendered antifungal and antibacterial by the incorporation therein of an effective amount of a cinnamon compound selected from the group consisting of cinnamic aldehyde, cinnamon oil, hydrocinnamaldehyde, and cinnamic acid, and rendered substantive by the incorporation therein of 1 to 5 percent by weight of a free fatty acid or of 5 to 45 weight percent of an emollient.

4,477,362

METHOD FOR PREPARING NITROGEN- AND OXYGEN-CONTAINING COMPOSITIONS USEFUL AS LUBRICANT AND FUEL ADDITIVES

Thomas F. Steckel, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Mar. 18, 1981, Ser. No. 244,946
Int. Cl.³ C10M *1/32*
U.S. Cl. 252—51.5 R **14 Claims**

1. A lubricant composition comprising a major amount of an oil of lubricating viscosity and a minor amount of at least one nitrogen- and oxygen-containing compositions prepared by reacting, in the presence of an acidic catalyst.

(A) at least one aliphatic hydroxy compound of the formula $R^1(OH)_x$ wherein R^1 is an aliphatic hydrocarbon-based radical and x is an integer which is at least 1, with

(B) at least one (tertiary amino) alkanol.

4,477,363

FREE FATTY ALCOHOL AND BUFFERED ALKALI EARTH METAL SURFACTANT CAKES FOR OPTIMUM PERFORMANCE

Louis F. Wong, Mason; Rosstain F. Sterling, Milford, both of Ohio, and Thomas A. Borcher, Sr., Melbourne, Ky., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 23, 1982, Ser. No. 452,469
Int. Cl.³ C11D *17/00, 3/065, 1/12*
U.S. Cl. 252—134 **36 Claims**

1. In conjunction with a toilet tank dosing dispenser, a substantially stable solid cake comprising from 1% to 15% free fatty alcohol, from 40% to 90% of an alkali earth metal alkyl sulfate, 0% to 30% perfume, 0% to 12% of a dye, and 0% to 40% of a compatible water-soluble salt; said cake weighing from 10 gms to 120 gms and having a density of 0.8 to 1.5, said cake having a pH of 6 to 10, said cake containing at least 1.5% of at least one of said perfume or dye.

4,477,364

ACIDIC GLASS CLEANING COMPOSITION

Silverio M. Garcia, Norman, Okla., assignor to Capetrol International, Inc., Norman, Okla.

Filed Nov. 7, 1983, Ser. No. 549,289
Int. Cl.³ C11D *7/08*
U.S. Cl. 252—142 **5 Claims**

1. An acidic glass cleaning composition comprising from about 1 to about 15 weight percent hydrofluoric acid and from about 85 to about 99 weight percent of an aqueous acidic composition having a pH value of less than about 1, the aqueous acidic composition prepared by the steps of:

(a) mixing from about 20 to about 30 weight percent hydrochloric acid with from about 16 to about 26 weight percent phosphoric acid for an effective period of time to produce a substantially homogeneous acidic mixture;

(b) admixing the substantially homogeneous acidic mixture into an effective amount of water to provide an aqueous acidic mixture containing from about 30 to about 50 weight percent water;

(c) admixing from about 5 to about 11 weight percent of a hydroxy carboxylic acid into the aqueous acidic mixture to produce a hydroxy carboxylic acid containing aqueous acidic mixture; and

(d) admixing from about 3 to about 7 weight percent of a dicarboxylic acid into the hydroxy carboxylic acid containing aqueous acidic mixture.

4,477,365

CAUSTIC BASED AQUEOUS CLEANING COMPOSITION

Gilles M. L. Verboom, Bolingbrook; Kenneth E. Bliznik, Dolton, and Thomas L. Welsh, Downers Grove, all of Ill., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 455,946, Jan. 6, 1983, abandoned. This application Aug. 29, 1983, Ser. No. 526,952
Int. Cl.³ C11D *7/06*
U.S. Cl. 252—156 **24 Claims**

1. A caustic based, aqueous cleaning composition which comprises on a weight/weight basis of 100% active material:

(a) 7% to 10% of an alkali metal hydroxide;

(b) 0.1% to 2.0% of a fatty acid substituted betaine, amido betaine, sulfo betaine, amido sulfo betaine or a mixture thereof;

(c) 6% to 11% of one or a mixture of longchain alpha olefin sulfonates; and

(d) a hydrotropic agent whose chemical structure and concentration are such as, in combination with ingredients (a), (b), and (c), to provide the cleaning composition with a viscosity of 200 to 2,000 centipoise at room temperature.

4,477,366

SILICONE SURFACTANT/ORGANOFUNCTIONAL POLYSILOXANE INTERNAL MOLD RELEASE AGENTS

John R. Robertson, Glenn Mills, Pa., assignor to ICI Americas Inc., Wilmington, Del.

Filed May 23, 1983, Ser. No. 497,037
Int. Cl.[3] C09K 3/00; H05B 33/00
U.S. Cl. 252—182 17 Claims

1. A liquid for use in preparing reaction injected molded polyurethane or polyurea resins having improved mold release properties which comprises a polysiloxane mold release agent which consists essentially of 0.5–20 mol percent of $R_aR'_bSiO_{[4-(a+b)]/2}$ units and from 80–99.5 mol percent of $R''_cSiO_{(4-c)/2}$ units where R is an isocyanate reactive organic radical, a has an average value of from 1–3, R′ and R″ are both non-isocyanate reactive organic radicals, b has an average value of 0–2, a+b is from 1–3, and c has an average value of from 1–3, wherein

the ratio of the total molecular weight to the total number of isocyanate reactive functional groups in the molecule ranges from 100–3500,

the combined formula weights of all isocyanate reactive organic radicals, R do not exceed 40% of the total molecular weight of said polysiloxane mold release agent,

the combined formula weights of all non-isocyanate reactive radicals, R′+R″ together do not exceed 40% of the total molecular weight of said polysiloxane mold release additive,

the combined formula weights of all the organic radicals R+R′+R″ in the molecule together do not exceed 60% of the total molecular weight of the molecule,

said polysiloxane mold release agent contains an average of at least two isocyanate reactive functional groups per molecule,

at least two of the isocyanate reactive functional groups in each molecule are located on separate organic radicals, R, attached independently to different silicon atoms in said polysiloxane,

said isocyanate reactive functional groups (R) are selected from the group consisting of alcohols, phenols, thiols, primary or secondary aromatic amines, which contain no oxygen, and not more than one nitrogen, atoms attached directly to, in conjugation with, or incorporated within, the aromatic ring nucleous, and secondary aliphatic amines wherein at least one of the alkyl carbon atoms, bonded directly to the nitrogen atom, is not a primary carbon atom and carboxylic acids,

the molecular weight of said polysiloxane mold release agent ranges from 1000 and 30,000, and

said polysiloxane mold release agent being substantially insoluble in said liquid polyisocyanate, and from 1–25 percent based on the weight of said polysiloxane mold release agent of a liquid silicone surfactant substantially free of isocyanate reactivity.

4,477,367

CRYSTALLINE 2-LAYER LITHIUM-HYDROXY ALUMINATES

John L. Burba, III, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 217,614, Dec. 18, 1980, Pat. No. 4,348,295. This application Aug. 30, 1982, Ser. No. 412,613
The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.
Int. Cl.[3] B01D 15/04; C01D 15/00; C08D 5/20
U.S. Cl. 252—184 9 Claims

1. A process for preparing crystalline 2-layer $LiOH.2Al(OH)_3.nH_2O$, said process comprising

contacting crystalline 2-layer $LiX.2Al(OH)_3.nH_2O$ with an aqueous solution of LiOH, or other hydroxide ion source, at a temperature in the range of about 15° C. to about 70° C., where X is halide,

thereby exchanging OH^- ions for X^- ions and forming crystalline 2-layer $LiOH.2Al(OH)_3.nH_2O$.

3. A process for replacing the X anion of crystalline 2-layer $LiX.2Al(OH)_3.nH_2O$ with a larger anion, X′, said process comprising

reacting the $LiX.2Al(OH)_3.nH_2O$ with LiOH, or other hydroxide ion source, at a temperature in the range of about 0° C. to about 100° C., thereby forming crystalline 2-layer $LiOH.2Al(OH)_3.nH_2O$, and

reacting the so-formed $LiOH.2Al(OH)_3.nH_2O$ with an acid or salt form of the larger X′ anion, thereby forming crystalline 2-layer $LiX'.2Al(OH)_3.nH_2O$.

4. The process of claim 3 where the X anion is at least one of the group comprising chloride, bromide, and iodide and the X′ anion is at least one of the group comprising NO_3^-, $H_2PO_4^-$, HPO_4^{-2}, PO_4^{-3}, $HCOO^-$, ClH_2COO^-, Cl_2HCOO^-, CCl_3COO^-, CH_2CHCOO^-, and $C_6H_5O^-$.

9. The process of claim 3 wherein the $LiX.2Al(OH)_3.nH_2O$ is supported within the pores of a macroporous beads comprising a copolymer of styrene and divinylbenzene having pendant amine or quaternary ammonium groups.

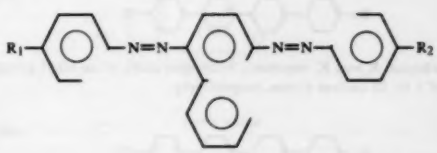
4,477,368

COLOR DISPLAY LIQUID CRYSTAL COMPOSITION

Fumiaki Yamanashi; Yuzo Hayashi, both of Iwaki; Mitsuru Kano, Furukawa; Yoshiyuki Fujiwara, Iwaki, and Yoshizo Tashiro, Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Sep. 30, 1982, Ser. No. 431,326
Claims priority, application Japan, Oct. 1, 1981, 56-156831
Int. Cl.[3] C09K 3/34; G02F 1/13
U.S. Cl. 252—299.1 5 Claims

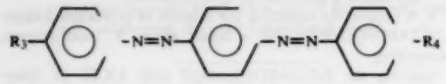
1. A color display liquid crystal mixture useful in phase transition type negative color liquid crystal display devices comprising a nematic liquid crystal having positive dielectric anisotropy, an optically active substance and from 0.4 to 0.9 wt. % of a dichroic dye mixture comprising 60 to 95 wt % of a dichroic reddish purple diazo dye which is a 1,4-naphthylene derivative of the structural formula:



wherein R_1 represents an alkyl group containing up to 5 carbon atoms and R_2 represents

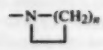
or

in which R and R′ each represent a lower alkyl group and n represents an integer of at least 4, and 40 to 5 wt % of a dichroic red diazo dye which is a 1,4-phenylene derivative of the structural formula:



wherein R_3 represents an alkyl group containing up to 5 carbon atoms and R_4 represents

or



in which R'' and R''' each represent a lower alkyl group and n represents an integer of at least 4.

4,477,369

NEW HIGH TEMPERATURE LIQUID-CRYSTALLINE SUBSTANCES CONSISTING OF 4 OR 5 SIX-MEMBER-RINGS AND LIQUID-CRYSTALLINE COMPOSITIONS CONTAINING SAME

Shigeru Sugimori, and Tetsuhiko Kojima, both of Kanagawaken, Japan, assignors to Chisso Corporation, Osaka, Japan

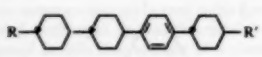
Filed Jan. 21, 1983, Ser. No. 460,071

Claims priority, application Japan, Jan. 22, 1982, 57-8291; Feb. 16, 1982, 57-23438; Mar. 8, 1982, 57-36100; Apr. 1, 1982, 57-54080; Apr. 1, 1982, 57-54081; May 10, 1982, 57-77928; May 20, 1982, 57-85272; Jul. 2, 1982, 57-115181; Jul. 2, 1982, 57-115182

Int. Cl.[3] **C09K** *3/34*; **G02F** *1/13*; **C07C** *13/28, 43/21, 43/215, 43/184, 35/21, 25/18, 49/613*

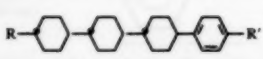
U.S. Cl. 252—299.6 **20 Claims**

1. Compounds selected from the group consisting of



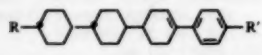
(II)

wherein R and R' represent hydrogen atom or an alkyl group of 1 to 10 carbon stoms, respectively;



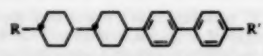
(III)

wherein R and R' represent hydrogen atom or an alkyl group or an alkoxy group, each of 1 to 10 carbon atoms, respectively;



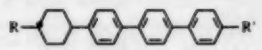
(IV)

wherein R and R' represent hydrogen atom or an alkyl group or an alkoxy group, each of 1 to 10 carbon atoms, respectively;



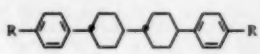
(V)

wherein R and R' represent hydrogen atom or an alkyl group or an alkoxy group, each of 1 to 10 carbon atoms, respectively;



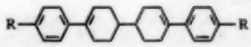
(VI)

wherein R and R' represent hydrogen atom or an alkyl group or an alkoxy group, each of 1 to 10 carbon atoms, respectively;



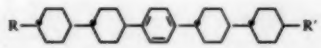
(VII)

wherein R represents hydrogen atom or an alkyl group or an alkoxy group, each of 1 to 10 carbon atoms, but the number of hydrogen atoms cannot exceed one;



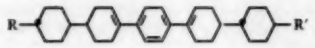
(VIII)

wherein R represents hydrogen atom or an alkyl group or an alkoxy group, each of 1 to 10 carbon atoms;



(IX)

wherein R and R' represent hydrogen atom or an alkyl group of 1 to 10 carbon atoms, respectively; and



(X)

wherein R and R' represent hydrogen atom or an alkyl group of 1 to 10 carbon atoms, respectively.

4,477,370

DEFOAMING COMPOSITION

Ronald W. Kavchok, Belle Mead, and Francis J. Boylan, Newton, both of N.J., assignors to Drew Chemical Corporation, Boonton, N.J.

Filed Apr. 15, 1983, Ser. No. 485,215

Int. Cl.[3] **B01D** *19/04*

U.S. Cl. 252—321 **3 Claims**

1. An aqueous, free flowing defoaming composition comprising as the primary component a 5–30% aqueous hydrophobic dispersion of a solid alcohol of 14–28 carbon atoms, a solid fatty acid of 14–28 carbon atoms, a soap of a solid fatty acid of 14–28 carbon atoms and a nonionic or anionic surfactant, the ratio by weight of acid and soap to alcohol being 0.2–0.4:1.0 and 0.1–0.5:1.0, respectively, and the ratio by weight of surfactant to combined alcohol, acid and soap being 0.1–0.4:1.0; and as the secondary component a dispersion of finely divided hydrophobic silica or ethylene-bis-stearamide in a water insoluble organic liquid, said primary and secondary components being present in a ratio by weight of the composition of 93–99.5% and 7.0–0.5%, respectively.

3. A method for defoaming a foamable system which comprises adding to the system an effective amount of a composition according to claim 1.

4,477,371
AQUEOUS DISPERSIBLE DEFOAMERS

Peter Huber; Franz Wimmer; Ernst Innertsberger, all of Burghausen, and Jakob Schmidlkofer, Mehring-Öd, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 29, 1983, Ser. No. 518,787

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1982, 3235256

Int. Cl.³ B01D *19/04;* **C09K** *3/00*

U.S. Cl. 252—358 **2 Claims**

1. An aqueous dispersible defoamer composition containing an organopolysiloxane, filler, a dispersant which is at least in part a surfactant and 2,2,4-trimethyl-1,3-diisobutyryloxypentane in an amount of from 10 to 90 percent by weight based on the weight of the organopolysiloxane, filler, dispersant and 2,2,4-trimethyl-1, 3-diisobutyryloxypentane, in which the organopolysiloxane contains SiC-bonded organic radicals and SiOC-bonded radicals having at least 6 carbon atoms per radical which are composed of carbon and hydrogen atoms or carbon, hydrogen and at least 2 oxygen atoms per radical.

4,477,372
ANIONIC NONIONIC SURFACTANT MIXTURE

Anthony J. O'Lenick, Fairlawn, N.J., assignor to Henkel Corporation, Minneapolis, Minn.

Filed May 13, 1982, Ser. No. 377,643

Int. Cl.³ C11D *1/18*

U.S. Cl. 252—545 **26 Claims**

1. A surfactant composition comprising:

(a) from about 40 percent to about 90 percent by weight of an organic sulfate of sulfonate in the acid form containing from about 8 to about 22 carbon atoms in the anionic portion of the molecule; and

(b) a sufficient amount to neutralize component (a) of an amine selected from the group consisting of:
N,N,N,-tris-(2-hydroxypropyl)amine;
N-(2-hydroxyethyl)-N-(2-hydroxybutyl)amine;
N-(2-hydroxybutyl)-N-(3-hydroxy-2-methylpropyl)amine;
N-(2-hydroxypropyl)-N-(butyl)amine;
N-(2-hydroxypropyl)-N-(2-hydroxybutyl)amine; and
2,2-bis(hydroxymethyl)-2,2',2''-nitrilotriethanol
and mixtures thereof,

(c) from about 10 percent to about 60 percent by weight of an alkoxylated nonionic surfactant.

4,477,373
MOLTEN SALT HAZARDOUS WASTE DISPOSAL PROCESS UTILIZING GAS/LIQUID CONTACT FOR SALT RECOVERY

LeRoy F. Grantham, Calabasas, and Donald E. McKenzie, Woodland Hills, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 4, 1982, Ser. No. 385,155

Int. Cl.³ C09K *3/00, 11/04*

U.S. Cl. 252—626 **6 Claims**

1. A process for concentrating a plutonium-containing waste material which comprises:

combusting said plutonium-containing waste material in a molten salt comprising an alkali metal carbonate;

recovering from said combustion a gaseous product having a temperature in the range of about 700°–1000° C. and a melt containing spent alkali metal carbonate and plutonium oxide;

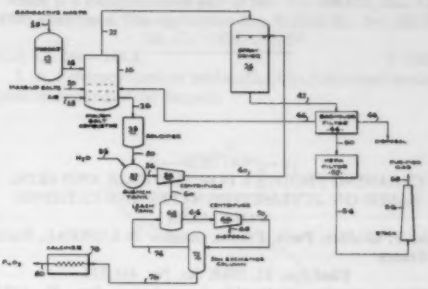
dissolving said melt to form a slurry containing a mixture of ash and plutonium oxide in an alkali metal carbonate solution;

separating said mixture of ash and plutonium oxide from said slurry;

recovering plutonium values from said mixture;

introducing the solution from which said mixture of ash and plutonium oxide have been separated into spray contact with said gaseous product in a spray drying zone;

separating from said spray drying zone a cooled gaseous product having a temperature in the range of about



50°–250° C., and a solid, flowable product containing alkali metal carbonate;

separating said solid, flowable product from said cooled gaseous product; and

recycling said solid, flowable product to said molten salt.

4,477,374
TERNARY INTERCALATION COMPOUND OF A GRAPHITE WITH A METAL FLUORIDE AND FLUORINE, A PROCESS FOR PRODUCING THE SAME, AND AN ELECTRICALLY CONDUCTIVE MATERIAL COMPRISING THE TERNARY INTERCALATION COMPOUND

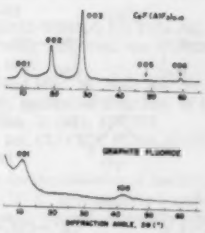
Nobuatsu Watanabe; Tsuyoshi Nakajima, both of Kyoto, and Masayuki Kawaguchi, Wakayama, all of Japan, assignors to Central Glass Co., Ltd., Ube, Japan

Filed Jul. 2, 1982, Ser. No. 394,530

Claims priority, application Japan, Oct. 3, 1981, 56-157807; Oct. 3, 1981, 56-157808

Int. Cl.³ H01B *1/02*

U.S. Cl. 252—508 **11 Claims**



1. A ternary intercalation compound of a graphite with a metal fluoride and fluorine produced by the reaction between a graphite, a metal fluoride and fluorine and which is represented by the formula $C_xF(MF_z)_y$, wherein M is Al or Mg; z is an integer corresponding to the valence of M; and the relative values of x and y are determined by the time and temperature of said reaction between the graphite, the metal fluoride and fluorine and the crystallinity and c-axial thickness of the graphite.

10. An electrically conductive material which comprises a ternary intercalation compound of a graphite with a metal fluoride and fluorine produced by the reaction between a graphite, a metal fluoride and fluorine and represented by the formula $C_xF(MF_z)_y$, wherein M is Al or Mg; z is an integer corresponding to the valence of M; and the relative values of

x and y are determined by the time and temperature of said reaction between the graphite, the metal fluoride and fluorine and the crystallinity and c-axial thickness of the graphite.

4,477,375

CLEANING PRODUCT FOR THE HAIR AND SKIN, BASED ON ACYLISETHIONATES AND CATIONIC POLYMERS

Jean F. Grollier, Paris, France, assignor to L'OREAL, Paris, France

Filed Jan. 27, 1983, Ser. No. 461,524

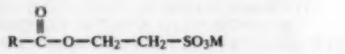
Claims priority, application Luxembourg, Jan. 29, 1982, 83911

Int. Cl.³ C11D *1/12, 1/65, 1/62;* A61K *7/06*

U.S. Cl. 252—542 15 Claims

1. A cleaning composition for the hair and skin consisting essentially of, in combination, in a cosmetically acceptable medium,

(a) at least one surface-active agent of the formula:

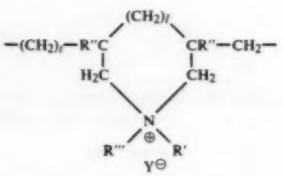


wherein R denotes a linear or branched alkyl group and M denotes on alkali metal or alkaline earth metal or an amine, and

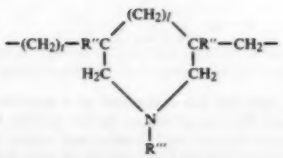
(b) at least one cationic polymer selected from

(i) cellulose ether derivatives containing quaternary ammonium groups,

(ii) cyclic polymers containing, as the main constituent of the chain, units corresponding to the formula (III) or (III'):



(III)



(III')

wherein l and t are 0 or 1 and l+t=1, R'' denotes hydrogen or methyl, R''' and R' independently of one another denote an alkyl group having 1 to 22 carbon atoms, a hydroxyalkyl group or a lower amidoalkyl group or R''' and R' together with the nitrogen atom to which they are attached, denote a heterocyclic group and $Y^{\ominus}$ denotes an anion, and

(iii) copolymers containing said units of the formula (III) or (III') and units derived from acrylamide or from diacetoneacrylamide.

4,477,376

CASTABLE MIXTURE FOR INSULATING SPLICED HIGH VOLTAGE CABLE

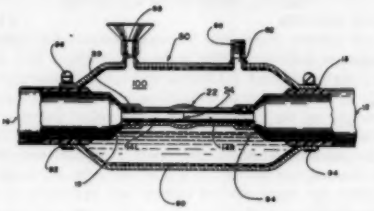
Marvin H. Gold, , Fairoaks, Calif.

Division of Ser. No. 128,970, Mar. 10, 1980, Pat. No. 4,354,053.

This application Nov. 18, 1981, Ser. No. 322,529

Int. Cl.³ H01B *3/22*

U.S. Cl. 252—572 9 Claims



1. A castable mixture for insulating high voltage cable conductor commprising a liquid polyolefin having addition polymer reactable sites, a particulated solid saturated polyolefin, a chain extension agent reactable with said polyolefin's reactable sites, wherein said unsaturated liquid polyolefin is present in the range of 75% to 40%, by weight;

said particulated saturated polyolefin is present in the range of 25% to 60% by weight; and

a molecularly equivalent amount of chain extension agent to the liquid polyolefin.

4,477,377

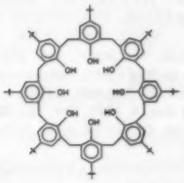
RECOVERY OF CESIUM

Reed M. Izatt; James J. Christensen, both of Provo, and Richard T. Hawkins, Orem, all of Utah, assignors to Brigham Young University, Provo, Utah

Filed Jun. 17, 1982, Ser. No. 389,402

Int. Cl.³ G21F *9/04, 9/12*

U.S. Cl. 252—631 8 Claims



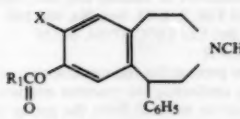
1. The process of recovering cesium ions in higher concentration from mixtures thereof with other ions which comprises (1) establishing a separate aqueous source phase of the ions to be separated of basic pH, (2) establishing a separate aqueous recipient phase, (3) establishing a liquid membrane phase containing a macrocyclic calixarene ligand in a liquid membrane solvent interfacing with the source phase and the recipient phase, (4) maintaining this interfacial contact for a period of time long enough to transport a substantial part of the cesium ions from the source phase to the recipient phase, and (5) recovering the cesium ions from said recipient phase.

4,477,378
ESTERS OF SUBSTITUTED 8-HYDROXY-1-PHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINES

Elijah H. Gold, West Orange, and Wei K. Chang, Livingston, both of N.J., assignors to Schering Corp., Kenilworth, N.J.

Continuation of Ser. No. 118,389, Feb. 5, 1980, Pat. No. 4,349,472, which is a continuation of Ser. No. 34,048, Apr. 27, 1979, abandoned. This application Sep. 9, 1982, Ser. No. 416,513
Int. Cl.³ C07D 223/16; A61K 31/55
U.S. Cl. 260—239 BB 20 Claims

1. Esters of substituted 8-hydroxy-1-phenyl-2,3,4,5-tetrahydro-1-H-3-benzazepines represented by the general formula I



I

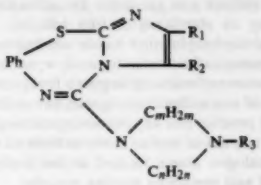
wherein X is chloro, bromo or trifluoromethyl; R_1 is branched or straight chain alkyl of 1 to 20 carbon atoms, unsubstituted-phenylalkyl wherein the alkyl is branched or straight chain of 1 to 6 carbon atoms, substituted-phenylalkyl wherein the alkyl is branched or straight chain of 1 to 6 carbon atoms and the substituents on the phenyl are halogen, straight or branched chain alkyl of 1 to 4 carbon atoms, straight or branched chain alkoxy of 1 to 4 carbon atoms, hydroxy, nitro, trifluoromethyl or cyano, unsubstituted phenyl or substituted phenyl wherein the substituents are halogen, straight or branched chain alkyl or 1 to 4 carbon atoms, straight or branched chain alkoxy of 1 to 4 carbon atoms, hydroxy, nitro, trifluoromethyl or cyano, alkoxyalkyl wherein the alkoxy moiety is straight or branched chain of 1 to 6 carbon atoms and the alkyl moiety is straight or branched chain of 1 to 6 atoms, aryloxyalkyl wherein the aryl moiety is unsubstituted phenyl or substituted phenyl wherein the substituents on the phenyl are halogen, straight or branched chain alkyl of 1 to 4 carbon atoms, straight or branched chain alkoxy of 1 to 4 carbon atoms, hydroxy, nitro, trifluoromethyl or cyano, and wherein the alkyl moiety is branched or straight chain with 1 to 6 carbon atoms, aralkoxyalkyl wherein the aralkoxy moiety is unsubstituted-phenylalkoxy wherein the alkoxy is branched or straight chain of 1 to 6 carbon atoms or substituted-phenylalkoxy wherein the alkoxy is branched or straight chain of 1 to 6 carbon atoms and the substituents on the phenyl are halogen, straight or branched chain alkyl of 1 to 4 carbon atoms, straight or branched chain alkoxy of 1 to 4 carbon atoms, hydroxy, nitro, trifluoromethyl or cyano and the alkyl moiety is branched or straight chain of 1 to 6 carbon atoms, cycloalkylalkyl wherein the cycloalkyl moiety is of 4 to 8 carbon atoms and the alkyl moiety is straight or branched chain of 1 to 6 carbon atoms, alkoxycarbonylalkyl wherein the alkoxy moiety is straight or branched chain of 1 to 4 carbon atoms and the alkyl moiety is straight or branched chain of 1 to 6 carbon atoms, cycloalkyl of 4 to 8 carbon atoms, cycloalkoxyalkyl wherein the cycloalkoxy moiety is of 4 to 8 carbon atoms and the alkyl moiety is straight or branched chain of 1 to 6 carbon atoms, straight or branched chain alkoxy of 1 to 6 carbon atoms, aralkoxy as defined hereinabove or aryloxy as defined hereinabove; and the pharmaceutically acceptable acid addition salts thereof.

4,477,379
IMIDAZOBENZOTHIADIAZEPINES

Isidoros Vlattas, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 259,261, May 11, 1981, Pat. No. 4,391,808, which is a continuation-in-part of Ser. No. 158,671, Jun. 12, 1980, abandoned. This application Aug. 9, 1982, Ser. No. 406,759
Int. Cl.³ C07D 513/04
U.S. Cl. 260—243.3 3 Claims

1. A 5-diazacycloalkyl-imidazo[2,1-b][1,3,5]benzothiadiazepine compound of the formula



wherein each of R_1 and R_2 is hydrogen or lower alkyl; Ph is 1,2-phenylene, unsubstituted or substituted by one member selected from lower alkyl, lower alkoxy, lower alkylthio, halogeno, trifluoromethyl, sulfamoyl, mono- or di-lower alkylsulfamoyl; C_mH_{2m} is lower alkylene separating both nitrogen atoms by 2 carbon atoms; C_nH_{2n} is lower alkylene separating both nitrogen atoms by 3 carbon atoms; and R_3 is lower alkyl or lower hydroxyalkyl wherein the hydroxy group is separated from the nitrogen atom by 2 carbon atoms; the oxides thereof; or a pharmaceutically acceptable salt thereof.

4,477,380
OXIDATION PROCESS OF REACTIVE AROMATICS WITH REACTIVATION OF THE CATALYST USING POTASSIUM PERMANGANATE

Ulrich Knips, Kamen-Heeren-Werve; Bertram Bohmer, Lunen, and Roland Herzberg, Castrop-Rauxel, all of Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Fed. Rep. of Germany

PCT No. PCT/EP82/00058, § 371 Date Jul. 23, 1982, § 102(e) Date Jul. 23, 1982, PCT Pub. No. WO82/03625, PCT Pub. Date Oct. 28, 1982
PCT Filed Mar. 23, 1982, Ser. No. 403,615
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1981, 3115971; Mar. 3, 1982, 3207572
Int. Cl.³ C07C 46/04, 51/265
U.S. Cl. 260—385 6 Claims

1. In a process for the oxidation of reactive aromatic components at 70° to 170° C. in solution in a carboxylic acid in the presence of a cobalt catalyst optionally containing a manganese compound and a bromine compound as cocatalyst with molecular oxygen, the proportional values of the catalyst component having the following ranges

$$1.0 \leqq X+Y+Z \leqq 10.0 \quad (1)$$

$$0.1 \leqq Z/(X+Y) \leqq 2.5 \quad (2)$$

$$0.2 \leqq (X/Y) \leqq 20 \quad (3)$$

wherein X is the amount by weight of cobalt per 50 parts by weight of reactive aromatic, Y is the amount by weight of manganese per 50 parts by weight of reactive aromatic and Z is the amount by weight of bromine per 50 parts by weight of reactive aromatics, the improvement comprising treating the catalyst solution with potassium permanganate at about 80° to 100° C. and removing the water of reaction by distillation before recycle to the oxidation step.

4,477,381

TRIAMINOTRIARYLMETHANE COLORANTS

Udo Mayer, Frankenthal; Erwin Hahn, Heidelberg, and Joachim Jesse, Schwetzingen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 19, 1982, Ser. No. 350,358
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1981, 3108720
Int. Cl.³ C09B 11/10
U.S. Cl. 260—392 5 Claims

1. A mixed triaminotriarylmethane colorant having an upper limit of one sulfonic acid group per dye molecule obtainable by first reacting an aluminum or iron trihalide complex of a 4,4',4''-trihalotriphenylmethyl halide starting material with a sufficient amount of a metanilic acid, a sulfanilic acid or a β-naphthalaminesulfonic acid to give a first product having an upper limit of one sulfonic acid group per molecule and then reacting the product and any remaining starting material with a sufficient amount of one or more anilines to replace all the unreacted halogen atoms located in the 4-positions of said product and said remaining starting material.

4,477,382

PREPARATION OF CARBOXYLIC ACID ANHYDRIDES

Anil B. Goel, Worthington, and Harvey J. Richards, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Dec. 21, 1982, Ser. No. 451,826
Int. Cl.³ C07C 51/56
U.S. Cl. 260—398 14 Claims

1. The process for converting a carboxylic acid having the formula RCOOH wherein R is a hydrocarbon group having from 1 to 20 carbon atoms into its anhydride consisting essentially of contacting the carboxylic acid with a catalyst composed of the salt of at least one metal selected from the group consisting of palladium, cobalt, manganese, chromium, nickel, copper, rhodium, iron, and thorium at a temperature in the range of from 120° to 300° C.

13. The process for converting octanoic acid into its anhydride consisting essentially of contacting the acid with a catalyst composed of $Pd(OAc)_2$, $Sb(OAc)_3$ and $Cr(OAc)_3.H_2O$ at a temperature in the range of from 120° to 300° C.

14. The process for converting lauric acid into its anhydride consisting essentially of contacting the acid with a catalyst composed of Rh_2O_3 at a temperature in the range of from 120° to 300° C.

4,477,383

DI- AND TRIPENTAERYTHRITOL ESTERS OF ISOSTEARIC ACID

Bruce J. Beimesch, Crescent Springs, Ky.; Nicholas E. Schnur, Cincinnati, and Clarence J. Hughes, Jr., Camp Dennison, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed May 5, 1982, Ser. No. 375,058
Int. Cl.³ C09F 5/08
U.S. Cl. 260—410.6 5 Claims

1. A polyol ether ester having a hydroxyl value less than 10, flashpoint greater than 500° F. and pour point less than 20° F. comprising the reaction product of a molar excess of isostearic acid, obtained as a by-product from the manufacture of polymer fatty acids from naturally occuring unsaturated C_{18} fatty acids, and a polyol ether of pentaerythritol having from 6 to 8 hydroxyl groups and containing at least 85 percent by weight dipentaerythritol, tripentaerythritol and higher oligomers and less than 15% by weight monopentaerythritol.

4,477,384

PREPARATION OF α-SUBSTITUTED ACRYLIC ACIDS

Samuel Serota, Philadelphia, and Warner M. Linfield, Oreland, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 20, 1981, Ser. No. 236,084
Int. Cl.³ C07D 263/14; C08H 17/36; C07C 69/52, 57/02
U.S. Cl. 260—410.9 R 7 Claims

1. A process for the preparation of α-substituted acrylic acids, comprising, condensing a carboxylic acid with 2-amino-2-methyl propanol, neutralizing the resultant oxazoline reaction mixture, reacting the oxazoline with paraformaldehyde, heating the resultant intermediate derivatives in the presence of an azeotrope to obtain the methylene oxazoline derivatives and hydrolyzing for about 16.5 hours the methylene oxazoline in the presence of a 3-4N mixture of HCl, glacial acetic and water.

4,477,385

MANUFACTURE OF HIGHER ARYL ESTERS

Anil B. Goel, Worthington, and Michael E. Pettiford, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 2, 1983, Ser. No. 463,164
Int. Cl.³ C07C 67/04, 67/38
U.S. Cl. 260—410.9 R 13 Claims

1. An oxidation process for the manufacture of higher aryl esters comprising contacting the reaction mixture of a higher aromatic hydrocarbon selected from the group consisting of naphthalene, anthracene, biphenyl, phenanthrene, fluorene, and terphenyls, an organic solvent, a carboxylic acid and molecular oxygen in the liquid phase at a temperature in the range of from 100° to 300° C. with a catalyst composed of a palladium carboxylate, an antimony carboxylate and a carboxylate of at least one member selected from the group consisting of alkali metals and alkaline earth metals.

4,477,386

METHOD FOR PRODUCING OIL FROM RICE EMBRYO-BUDS

Kenjiro Fujita, 279 Fukuicho, Ono-shi, Hyogo, Japan

Filed Dec. 31, 1981, Ser. No. 336,267
Claims priority, application Japan, Jan. 31, 1981, 56-13256
Int. Cl.³ C09F 5/02; C11B 1/00
U.S. Cl. 260—412.2 4 Claims

1. A method for producing oil from rice embryo-buds comprising the ordered steps of:

separating the rice embryo-buds from rice bran; and

pressing the rice embryo-buds in a press at high pressure while cooling the press whereby said oil is exracted from the rice embryo-buds at a low temperature.

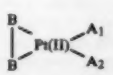
4,477,387

PLATINUM(II) COMPLEXES

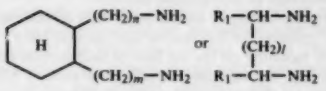
Yoshinori Kidani, and Masahide Noji, both of Nagoya, Japan, assignors to Otsuka Chemical Co., Ltd., Osaka, Japan

PCT No. PCT/JP81/00154, § 371 Date Mar. 2, 1982, § 102(e) Date Mar. 2, 1982, PCT Pub. No. WO82/00145, PCT Pub. Date Jan. 21, 1982
PCT Filed Mar. 4, 1981, Ser. No. 355,742
Claims priority, application Japan, Jul. 5, 1980, 55-92066
Int. Cl.³ C07F 15/00
U.S. Cl. 260—429 R 9 Claims

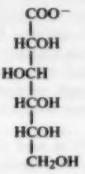
1. A platinum(II) complex represented by the general formula:



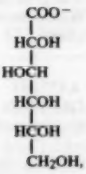
wherein —B—B— is



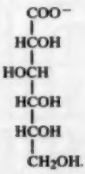
(in which R_1 and R_2 are the same or different and each is hydrogen, an alkyl group or an aryl group, and n, m and l are 0 or is an integer of from 1 to 3), at least one of A_1 and A_2 is



and the other is



Cl^-, Br^-, I^-, F^-, XCH_2COO^- (in which X is a halogen atom), NO_3^-, SO_4^{--}, $H_2PO_4^-$ or H_2O or, when taken together, A_1 and A_2 may form a ring together with Pt(II), in the latter case $-A_1-A_2-$ being



4,477,388

VINYLSTANNYL DERIVATIVES

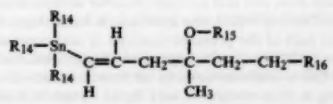
Middleton B. Floyd, Jr., Suffern; Charles V. Grudzinskas, Upper Nyack, both of N.Y., and Sow-Mei L. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 923,296, Jul. 10, 1978, which is a continuation-in-part of Ser. No. 853,941, Nov. 22, 1977, Pat. No. 4,233,231. This application Oct. 7, 1983, Ser. No. 540,098

Int. Cl.³ C07F *7/22*

U.S. Cl. 260—429.7 **4 Claims**

1. A compound of the formula:



wherein R_{14} is lower alkyl having 1–6 carbon atoms; R_{15} is trialkylsilyl wherein the alkyls have from 1–4 carbon atoms; and R_{16} is lower alkyl having 1 to 4 carbon atoms.

4,477,389

POLYHALOGENATED PHENYL ISOCYANATE SYNTHESIS WITH EXCESS PHOSGENE AND EITHER TRIETHYLAMINE OR TETRAMETHYLUREA

George C. Chen, and Roger M. Rowell, both of Madison, Wis., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 25, 1982, Ser. No. 436,542

Int. Cl.³ C07C *118/02*

U.S. Cl. 260—453 PH **8 Claims**

1. A method for preparing a tri-, tetra-, or pentahalogenated aromatic isocyanate comprising reacting a corresponding polyhalogenated phenylamine with an excess of phosgene in the presence of at least about 0.013 mol of tetra (lower alkyl) urea or about 2 mol of tri (lower alkyl) amine per mol of polyhalogenated phenylamine.

4,477,390

AMINOMETHYLENEPHOSPHONIC ACID SOLUTIONS

Michel A. O. Ledent, Namur, and Bronislav H. May, Overijse, both of Belgium, assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 21, 1981, Ser. No. 294,872

Int. Cl.³ C07F *9/38*

U.S. Cl. 260—502.5 E **16 Claims**

1. An aqueous solution comprising an aminomethylenephosphonic acid selected from diethylenetriaminepenta(methylenephosphonic acid), diethylenetriaminetetra(methylenephosphonic acid), diethylenetriaminetri(methylenephosphonic acid) and mixtures thereof and a non-oxidizing mineral acid, characterized in that said mineral acid is present in an amount sufficient to inhibit crystallization of said aminomethylenephosphonic acid from the solution, said sufficient amount comprising an amount of hydrochloric acid which is at least about 12% by weight of the solution.

4,477,391

AMINO ACID ISOMERS, THEIR PRODUCTION AND THEIR MEDICINAL USE

James F. Collins, Flat 7, Langwood, 87 Langley Rd., Watford, Hertfordshire, England

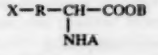
Filed Mar. 8, 1982, Ser. No. 356,036

Claims priority, application United Kingdom, Aug. 14, 1981, 8124899

Int. Cl.³ C07F *9/38*

U.S. Cl. 260—502.5 G **12 Claims**

1. A process for the production of a compound of formula (I)



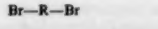
(I)

X stands for a phosphonic acid radical,

R stands for an alkylene, alkenylene, or alkynylene radical with 3 or more carbon atoms, or a C_3 to C_7 cycloalkyl radical, and

A and B independently of each other stand for a hydrogen atom or an ester group,

or a salt thereof comprising reacting (a) a dibromo compound of the formula

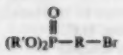


(II)

with a compound of the formula

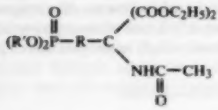
(III)

R' stands for an alkyl group,
$M^{\oplus}$ stands for an alkali metal cation,
and heating the resulting compound of the general formula



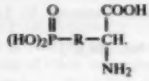
(IV)

with diethyl acetamidomalonate, and subjecting the resulting condensation product of the formula



(V)

to decarboxylation to give a compound of the formula



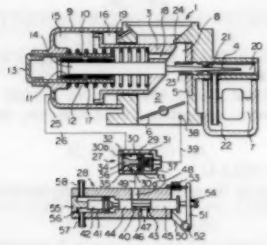
(Ia)

4,477,392

VARIABLE VENTURI-TYPE CARBURETOR

Norihiko Nakamura; Takaaki Itoh; Takashi Katou, all of Mishima; Yozo Ota, Chiryu, and Toshiharu Morino, Kuwana, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisan Industry Co., Ltd., both of, Japan

Filed Aug. 17, 1982, Ser. No. 408,796
Claims priority, application Japan, Dec. 21, 1981, 56-205203
Int. Cl.³ F02M 9/06
U.S. Cl. 261—39 A **6 Claims**



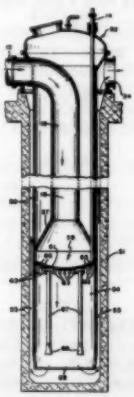
1. A variable venturi-type carburetor comprising:
an intake passage formed in said carburetor and having an inner wall;
a casing having therein an interior chamber which extends perpendicular to said intake passage;
a suction piston movably inserted into said casing and having a tip face which projects into said intake passage and defines a venturi portion, said suction piston dividing the interior chamber of said casing into an atmospheric pressure chamber and a vacuum chamber and having a suction hole interconnecting said vacuum chamber to said venturi portion for moving said suction piston in response to a change in the amount of air flowing within said intake passage;
a throttle valve arranged in said intake passage located downstream of said suction piston;
a fuel nozzle arranged on the inner wall of said intake passage opposite the top face of said suction piston;
a needle mounted on the tip face of said suction piston and extending through said nozzle, said suction hole being formed on the tip face of said suction piston at a position located upstream of said needle;
an air passage interconnecting said vacuum chamber to the atmosphere;
first means arranged in said air passage for controlling the fluid connection between said vacuum chamber and the atmosphere in response to a change in the engine temperature, said first means varying the flow area in said air passage in response to variations of engine temperature below a predetermined value and preventing fluid communication between said vacuum chamber and the atmosphere when the engine temperature is above said predetermined value; and
second means arranged in said air passage between said vacuum chamber and said first means for varying the flow area of said air passage in response to variations in vacuum generated in said intake passage downstream of said throttle valve, said first means preventing fluid-flow through said air passage when engine temperature is above said predetermined value regardless of the vacuum communicated to said second means.

4,477,393

APPARATUS FOR DISSOLUTION OF GASES IN LIQUID

Peter Kos, Ridgefield, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Division of Ser. No. 938,130, Aug. 30, 1978, abandoned. This application Jun. 4, 1982, Ser. No. 384,847
Int. Cl.³ B01F 3/04
U.S. Cl. 261—76 **5 Claims**



1. Apparatus for dissolving gas in a liquid comprising, an inlet for introducing a liquid stream into said apparatus, means for injecting a gas into said liquid stream to produce a mixed gas-liquid stream, a contact chamber arranged to receive said mixed gas-liquid stream for vertically downward flow therethrough, and a connecting vertical downcomer disposed intermediate said inlet and said contact chamber so that, when filled with the inflowing liquid, the hydrostatic head thereof develops at least part of the pressure required in said contact chamber, a flow distributor at the upper end of said contact chamber to assure that a uniform velocity of flow is achieved as measured along a cross-section of said liquid stream in said chamber, said flow distributor comprising a perforated plate having a plurality of stub tubes fixed in the plate perforations and

extending from said plate in a downstream direction, said contact chamber being of essentially uniform cross-section so that a substantially constant velocity of said mixed gas-liquid stream may be maintained therein, gas bubble collecting means located adjacent the lower end of said contact chamber to collect undissolved gas present in said mixed gas-liquid stream after it traverses said contact chamber, gas recycle means connecting said gas bubble collecting means to an upstream location in said liquid stream so that said gas is reinjected into said liquid stream, said perforated plate and the stub tubes thereof comprising a gas trap at said upstream location into which said gas recycle means discharges gas collected by said gas bubble collecting means, and an outlet to permit the treated liquid stream to exit said apparatus, said contact chamber being installed in a pit below ground level to utilize the hydrostatic pressure developed thereby in achieving said elevated pressure and said pit being water-tight so that the wall of said pit can serve as a conduit conducting liquid flow to or from said contact chamber.

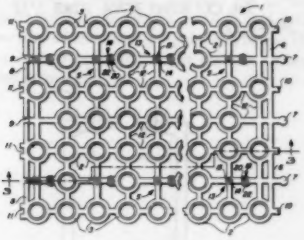
4,477,394
FLUID CONTACT PANEL

Charles M. Armstrong, Rte. 3, Box 70, Timpson, Tex. 75975, and Eddie D. Duke, P.O. Box 296, Tenaha, Tex. 75974

Continuation-in-part of Ser. No. 357,989, Mar. 15, 1982, abandoned. This application Apr. 28, 1983, Ser. No. 489,367

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—112 **11 Claims**



1. Fluid contact panels comprising an array of hollow, generally tubular-shaped substantially uniformly tapered members of selected length; a plurality of tapered fins spacing said tubular-shaped members; top connecting means and bottom connecting means provided in spaced relationship in selected ones of said tapered fins and fastener means cooperating with said top connecting means and said bottom connecting means for joining selected ones of said panels to each other in stacked relationship; and end connecting means provided at each end of each of said panels for joining selected ones of said panels to each other in end-to-end relationship.

4,477,395
APPARATUS FOR ADMIXING LIQUID ANESTHETICS AND RESPIRATORY GAS

Scato Albarda, Gross Schenkenberg, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,388

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1981, 3116951

Int. Cl.³ B01F *3/04*; **A61M** *16/00*

U.S. Cl. 261—131 **10 Claims**

1. An apparatus for admixing a vaporizable liquid with a gas comprising:

an insulated housing defining a mixing chamber;

an inlet conduit connected to the housing for a flow of gas to said chamber;

a liquid feed line in the inlet conduit for supplying liquid to said chamber, said feed line including a heat exchanger in said conduit for equating an inlet temperature of the liquid with an inlet temperature of the gas in said inlet conduit before the liquid and gas reach said chamber;

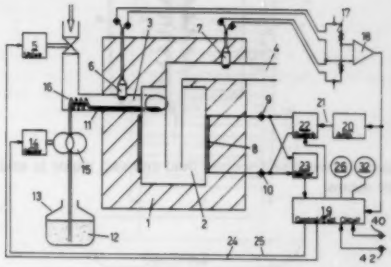
a first temperature sensor in said inlet downstream of said heat exchanger for sensing the inlet temperature;

an outlet conduit connected to said housing for a flow of vaporized liquid plus gas mixture from said housing;

a second temperature sensor in said outlet conduit for sensing an outlet temperature of the mixture;

liquid supply means connected to said feed line for supplying liquid at a selected liquid flow rate;

gas supply means connected to said inlet conduit for supplying gas at a selected gas flow rate;



liquid flow setting means connected to said liquid supply means for controlling said selected liquid flow rate to meet a nominal value for the liquid flow;

gas flow setting means connected to said gas supply means for controlling said selected gas flow rate to meet a nominal value for the gas flow; and

temperature difference circuit means connected to said first and second temperature sensors and connected to said liquid flow setting means for measuring a difference between said inlet and outlet temperatures, which difference is proportional to a ratio between the concentration of evaporated liquid and respiratory gas in the mixture to obtain an actual liquid flow rate for comparison with the nominal value for the liquid flow.

4,477,396
COUNTERCURRENT FLOW ABSORBER AND DESORBER

William H. Wilkinson, Columbus, Ohio, assignor to Battelle Development Corp., Columbus, Ohio

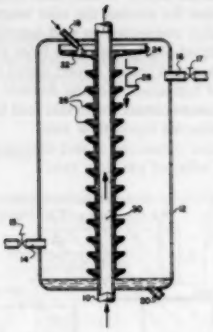
Continuation of Ser. No. 177,695, Aug. 13, 1980, abandoned. This application Dec. 9, 1981, Ser. No. 328,890

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—140 R **11 Claims**

1. Mass transfer and heat exchange apparatus operable interchangeably as an absorber and desorber comprising generally vertically oriented conduit means for transporting a first fluid, means defining a chamber enclosing a portion of said conduit means, said chamber means including means defining a vapor inlet, first valve means for opening and closing said vapor inlet, means defining a vapor outlet, second valve means for opening and closing said vapor outlet and a vapor present in said chamber means, said first and second valve means being controlled such that when said first valve means is open when said apparatus is operated as an absorber, said second valve means is closed, and when said second valve means is open when said apparatus is operated as a desorber, said first valve means is closed, means for supplying a second fluid to an external surface of said conduit means, said second fluid flowing in a direction opposite the direction of flow of said first fluid and being in heat exchange communication with said first fluid through the wall of said conduit means, and means arranged along the length of said conduit means for collecting portions

of said second fluid to provide local accumulations of said second fluid and a plurality of surfaces for mass transfer to



occur between said second fluid and said vapor in said chamber means.

4,477,397

METHOD FOR RECYCLING GREENWARE IN THE MANUFACTURE OF HYDROUS CALCIUM SILICATE INSULATION PRODUCTS

Jerry L. Helser, Hebron, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 21, 1978, Ser. No. 944,540
Int. Cl.³ C04B *1/00*
U.S. Cl. 264—37 **8 Claims**

1. A process for manufacturing low density hydrated calcium silicate heat insulating bodies comprising the steps of:

a. preparing a moldable slurry comprising a water dispersion of reactive calcareous and siliceous materials;

b. partially gelling the dispersion by heating at a temperature of approximately 180°–210° F.;

c. molding said partially gelled dispersion and expressing water therefrom thereby forming rigid greenware articles;

d. removing selected greenware articles for recycling to the process;

e. curing the remaining greenware articles by heating and pressurizing; and

f. pulverizing the selected greenware articles from step d and adding said pulverized greenware to the composition of step a in a subsequent cycle of the process.

4,477,398

YARN MONITORING PROCESS

James W. Henry, and Stanley R. Scroggin, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,156
Int. Cl.³ B29C *17/02*
U.S. Cl. 264—40.1 **7 Claims**

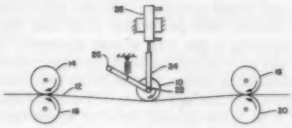
6. Method of moving a roll out of contact with a fiber bundle in response to its developing a slower speed than normal while being driven by frictional engagement with said fiber bundle which comprises

(a) generating an electrical signal at a magnetic reluctance pick-up as said roll moves past a reference point during each revolution,

(b) using said electrical signal to set a timer for a predetermined duration,

(c) timing each revolution of the roll by measuring time lapse between signals,

(d) comparing the time for each revolution with the timer of predetermined duration, and



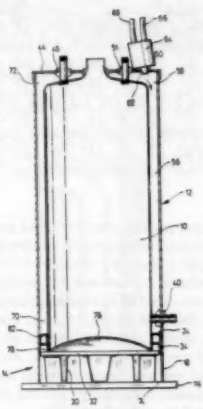
(e) actuating a mechanism to withdraw said roll from contact with the work piece if a revolution is longer in time than the predetermined duration.

4,477,399

METHOD AND APPARATUS FOR MANUFACTURING A FOAM INSULATED WATER HEATER

Robert W. Tilton, Oakville, Canada, assignor to GSW Inc., Toronto, Canada

Filed Jun. 16, 1982, Ser. No. 389,032
Int. Cl.³ B29D *27/04*; B28B *7/32*
U.S. Cl. 264—45.2 **26 Claims**



1. A method of manufacturing a water heater having an internal tank, an intermediate layer of expanded foam and an outer shell spaced from said internal tank by said intermediate layer, comprising

positioning the outer shell about said internal tank to at least partially form a cavity for said insulative material,

closing said partially formed cavity adjacent one end thereof by inflating an inflatable device between said shell and tank to define a boundary for said insulative material,

placing an expandable foam material into said cavity defined by said internal tank, said inflatable device and said outer shell,

waiting for said form material to expand and form said intermediate layer,

deflating said inflatable device and inspecting the area of said tank and outer shell adjacent the boundary previously formed by said inflatable device to assure said intermediate layer has been retained by said inflatable device during the expansion of said expandable foam material.

4,477,400

ROTATIONAL MOLDING METHOD USING POLYOLEFIN POWDER COMPOSITIONS

Erik R. Peerlkamp, Born, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Division of Ser. No. 298,253, Aug. 31, 1981, Pat. No. 4,440,899. This application Feb. 6, 1984, Ser. No. 577,335

Claims priority, application Netherlands, Aug. 30, 1980, 8004958

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—45.7 10 Claims

1. In a rotational molding process for preparing foamed plastic objects coated with an outer adhering polyolefin layer, said layer defining an enclosed volume filled with foamed plastic, including first preparing said polyolefin layer in a rotational mold, and thereafter introducing a foamable plastic into the enclosed volume defined by said polyolefin layer and foaming said plastic therein; the improvement consisting essentially of preparing said polyolefin layer by rotationally molding:

a polyolefin composition comprising an intimate admixture of about 20% to about 99.5% by weight of a first stabilized polyolefin powder containing at least 0.01 weight % of a stabilizing agent and about 0.5% to about 80% by weight of a second at most slightly stabilized polyolefin powder having a crystalline melting point which is at least 1° C. higher than that of said first stabilized polyolefin, and employing process conditions wherein said second polyolefin powder is oxidized, wherein the surface of said polyolefin layer contacting the wall of said mold consists substantially of stabilized polyolefin whereas the interior surface of said polyolefin layer consists substantially of oxidized polyolefin.

4,477,401

METHOD OF MANUFACTURING A DIELECTRIC

Hans J. Hagemann; Siegfried Hünten; Rolf Wernicke, all of Aachen, Fed. Rep. of Germany; Cornelius J. Klomp, and Willem Noorlander, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 2, 1982, Ser. No. 414,155

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138177

Int. Cl.³ C04B *35/46*

U.S. Cl. 264—61 10 Claims

1. A method of manufacturing ceramic capacitors comprising the steps of:

providing an unsintered capacitor body comprising a ferroelectric material having a perovskite structure and having the general formula ABO_3;

providing an electrode paste on the capacitor body to form a composite body, said paste comprising a base or oxide of a base metal selected from the group consisting of Ni, Cr or alloys thereof;

sintering the composite body in a reducing atmosphere at a temperature in the range of from 1320° to 1450° C. to form a sintered body having a metal electrode thereon;

cooling the sintered body; and then

aftertreating the sintered body by heating it at a temperature of from 500° to 900° C. for a period of time of from 0.5 to 4 hours in a nitrogen-oxygen atmosphere having a partial oxygen pressure of from 10^{-5} bar to 0.2 bar, wherein the temperature, duration, and partial oxygen pressure are chosen such that there is substantially no oxidation of the metal electrode.

4,477,402

METHOD OF MAKING SILICON NITRIDE COMPRISING OBJECTS

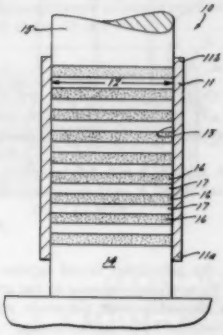
Andre Ezis, Grosse Ile, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/01112, § 371 Date Jul. 19, 1983, § 102(e) Date Jul. 19, 1983

PCT Filed Jul. 19, 1983, Ser. No. 528,228

Int. Cl.³ B28B *7/16*

U.S. Cl. 264—65 8 Claims



1. A method of making heat fused silicon nitride comprising objects, by the steps of:

(a) containerizing a series of measured powder shots in a common assembly to be used for both nitriding and heat fusion steps, the containerization being carried out by:

(i) lining the internal wall of a graphitic sleeve, treated for inertness, with a refractory metal foil essentially impervious to the migration of carbon ions and having a thickness of 0.02 inches or less,

(ii) inserting a series of measured shots of a powder mixture of silicon and oxygen carrying agents into said lined sleeve, preselected groups of said powder shots being separated by an inert spacer,

(b) heating said assembly with the shots of powder mixture therein in a nitriding atmosphere at a temperature below the melting point of silicon to convert each of said powder mixture shots to a nitrided silicon body consisting essentially of silicon nitride, 5–17% by weight oxynitrides, and less than 0.5% by weight unreacted oxygen carrying agents, said nitrided silicon bodies having less than required density and a dimension greater than required; and

(c) heating said assembly with the nitrided silicon bodies therein, with pressure normally associated with hot pressing, to a temperature above the melting point of silicon to heat fuse said silicon nitride and oxynitrides together, forming a predominantly silicon nitride body of required dimension and density.

4,477,403

METHOD OF MAKING AN ELECTROCHEMICAL SENSOR

Harold W. Pust, Huntington Beach, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 498,300, May 26, 1983,. This application Dec. 27, 1983, Ser. No. 565,538

Int. Cl.³ C04B *35/14;* G01N *27/40*

U.S. Cl. 264—104 6 Claims

1. A method of making an electrochemical sensor, comprising the steps of:

providing a housing having a cavity;

providing first and second porous substrates,

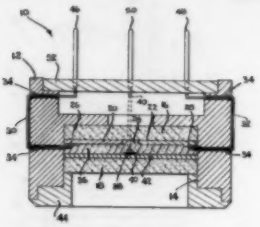
locating the first porous substrate in the cavity;

providing first and second porous electrodes, each having electrode connection means;

locating the first porous electrode adjacent the first porous substrate in the cavity;

providing a powdered liquid formed of a solution of liquid electrolyte blended with fumed silica in an amount of silica not less than 25% by weight of the blend;

distributing the powdered liquid over the first porous electrode in the cavity;



compacting the powdered liquid against the first porous electrode by applying pressure to the powdered liquid;

locating the second porous electrode adjacent the compacted powdered liquid in the cavity;

locating the second porous substrate adjacent the second porous electrode; and

applying pressure to the second porous substrate to further compact the powdered liquid between the first and second porous electrodes.

4,477,404

PROCESS FOR PRODUCING GROOVED CHOKE PLATES FOR ADJUSTABLE CHOKES

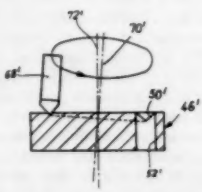
Kurt Stoll, Lenzhalde 72, D-7300 Esslingen, Fed. Rep. of Germany, and Hans-Heinrich Glättli, Seestr. 252, CH-8700 Küsnacht ZH, Switzerland

Filed May 10, 1982, Ser. No. 376,978

Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119090

Int. Cl.³ B29C *1/02*

U.S. Cl. 264—220 **3 Claims**



1. A process for manufacturing a choke plate for an adjustable choke mechanism adapted to control the rate of flow of a fluid, said choke plate having a surface with a groove therein and said groove having a cross-sectional area which varies along the length thereof so that various predetermined fluid flow rates occur at respective locations therealong, comprising the steps of: machining a groove in a surface of a pattern workpiece, said groove having various cross-sectional dimensions at respective locations therealong which are smaller than the dimensions required to achieve said predetermined flow rates at such locations; thereafter placing said surface of said pattern workpiece against a surface of a test device having means for causing fluid to flow through selected portions of said groove in said pattern workpiece, and then measuring the fluid flow rates through various portions of said groove; thereafter performing further machining of said groove in said pattern workpiece to increase the cross-sectional dimensions of said groove along the length thereof; repeating said steps of placing said pattern workpiece in a test device, measuring fluid flow rates at various locations in said groove thereof, and further machining said groove until said measured fluid flow rates through said groove are in conformity with said predetermined fluid flow rates; thereafter preparing a negative pattern of said pattern workpiece by electroplating; and thereafter placing said negative pattern in an injection molding apparatus so that said negative pattern defines a portion of a mold cavity thereof, injecting a quantity of a thermoplastic material into said mold cavity, cooling said quantity of said thermoplastic material in said mold cavity to form said choke plate, and removing said thermoplastic material from said mold cavity; wherein said steps of machining said groove in said pattern workpiece are carried out by moving a machining tool having a cutting outline representative of the cross-sectional shape of said groove about an axis which is arranged at a small angle with respect to a line normal to said surface of said pattern workpiece; and including just prior to said step of preparing said negative pattern a final machining step which includes the step of increasing said small angle slightly so as to increase the cross-sectional area of said groove in said pattern workpiece by an amount equivalent to the degree of shrinkage of said thermoplastic material in said mold cavity during said cooling step.

4,477,405

METHOD OF IN-MOLD COATING

Joseph M. Makhlouf, Mars; Gregory J. McCollum, Glenshaw, and Paul R. Kerr, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 336,226, Dec. 31, 1981, Pat. No. 4,425,468. This application Sep. 29, 1982, Ser. No. 427,397

Int. Cl.³ B29D *9/00*; B29C *6/00*

U.S. Cl. 264—250 **10 Claims**

1. A method of providing a molded article with a coating to eliminate surface defects, which comprises:

(a) placing on the outer surface of said article in a mold a charge of a curable thermosetting coating composition, said charge being sufficient to provide on said surface a coating having a thickness of less than about 20 mils;

(b) applying sufficient pressure to said charge to cause the coating composition to substantially and uniformly cover and penetrate said surface, the coating composition, comprising a dispersion of the following ingredients in an ethylenically unsaturated monomer:

(i) a polymerizable ethylenically unsaturated urea-urethane polymer prepared by a process, which comprises:

A. reacting a polyisocyanate, at least a portion of which is a diisocyanate, with a polyfunctional amine containing primary and/or secondary amino groups in the presence of a polyol, at least a portion of which is a polymeric polyol, free of ethylenic unsaturation and a diluent which is an ethylenically unsaturated compound free of active hydrogens, the equivalent ratio of isocyanate to active hydrogen in said polyol and said polyfunctional amine being within the range of 1.1 to 2.0/1 and the equivalent ratio of polyol to polyfunctional amine being within the range of 0.75 to 20/1, under conditions sufficient to form an NCO group-containing polyurea-polyurethane dispersed in an ethylenically unsaturated compound; followed by

B. reacting the NCO group-containing polyurea-polyurethane dispersion with an active hydrogen containing polymerizable ethylenically unsaturated compound under conditions sufficient to react the NCO-functionality with the active hydrogens thereby forming the polymerizable ethylenically unsaturated urea-urethane polymer dispersion;

(ii) a catalyst, and

(iii) a mold release agent;

(c) curing said coating composition in said mold under heat

and pressure to bond said coating composition to said surface; and

(d) removing said coated article from said mold, providing said article with a substantially smooth defect-free cross-linked polyurea-polyurethane based coating bonded to said surface of said article.

4,477,406

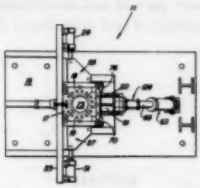
METHOD FOR MOLDING ELONGATED WORKPIECES

Patrick M. Luchsinger, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Division of Ser. No. 304,510, Sep. 22, 1981, Pat. No. 4,431,393. This application Oct. 24, 1983, Ser. No. 544,948

Int. Cl.³ B29C 1/00

U.S. Cl. 264—275 5 Claims



1. In a method of molding an elongated workpiece comprising the steps of:

providing a mold with three generally vertically oriented quadrants and with a fourth quadrant pivotably mounted relative to said three vertical quadrants between a mold open position and a generally vertically oriented mold closed position,

engaging an end plate with each end of an elongated workpiece;

locating said workpiece and end plates relative to said fourth quadrant located in a mold open position, and

moving said fourth quadrant to said mold closed position.

4,477,407

MACHINE DIRECTION ORIENTATION OF NYLON FILM

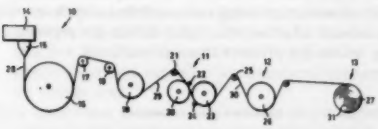
Brian L. Hetherington, Inverary; Peter H. Gray, and Alistair N. Mollison, both of Kingston, all of Canada, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 18, 1983, Ser. No. 467,823

Claims priority, application Canada, Feb. 23, 1982, 396859

Int. Cl.³ B29D 7/24; B29G 7/00

U.S. Cl. 264—288.4 5 Claims



1. A process wherein essentially unoriented nylon film is oriented between first and second counter-rotating orientation rolls, the ratio of the peripheral speed of the second of such rolls to that of the first of such rolls being between about 1.1 and about 5.5, each orientation roll having a nip roll associated therewith, said nip rolls applying substantially uniform force across the width of such nip rolls onto the associated orientation roll, the force applied by each of the nip rolls being in the range of 15 to 45 newtons per centimeter width of nip roll, the distance between the orientation rolls being in the range of 100 to 2050 μm, the temperature of the first orientation roll being held at between 70° and 180° C. and the temperature of the second orientation roll being held at between the temperature of the first orientation roll and 20° C. below the melting temperature of the nylon film, said nylon film being made from the group consisting of (a) a homopolymer of hexamethylenediamine adipate, and (b) a copolymer of hexamethylene diamine adipate and a comonomer selected from the group consisting of ε-caprolactam, 9-aminononanoic acid, 11-aminoundecanoic acid, 12-aminoduodecanoic acid, and hexamethylene diamine duodecanedioicate, the content of said hexamethylenediamine adipate in the copolymer being at least 10% by weight of the comonomer and hexamethylene diamine adipate prior to polymerization, said homopolymer or copolymer having a relative viscosity between about 40 and 100.

4,477,408

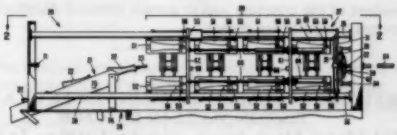
BLOW MOLDING METHOD

Michael J. Michl, Rosedale, and Larry W. English, Terre Haute, both of Ind., assignors to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 6,367,139, Apr. 9, 1982, abandoned. This application Mar. 8, 1983, Ser. No. 473,290

Int. Cl.³ B29C 17/07

U.S. Cl. 264—532 2 Claims



1. A blow molding method for forming a chain of hollow, shaped article bodies of biaxially oriented, normally highly crystalline thermoplastic material from a tube of said material in substantially unoriented condition, but at its orientation temperature, which comprises:

pulling said tube from a first point to a second point, and pushing beyond said second point that portion of the chain formed between said two points;

braking the travel of said tube past said first point during at least part of the time it is being pulled, whereby the part of said tube between said points becomes stretched;

closing the corresponding mold pieces of a plurality of stationary blow molds on said stretched part of said tube;

inflating the portions of the stretched part of the tube within the mold cavities defined by said corresponding mold pieces to form in each said mold cavity one of said bodies, and to biaxially orient the material thereof; and

sequentially opening said mold pieces, following said inflating, to minimize snap-back of said chain.

4,477,409

REINFORCED CONCRETE PRESSURE VESSELS FOR NUCLEAR REACTOR INSTALLATIONS

Josef Schöening, Hambruecken; Hans-Georg Schwiers, and Paul Mitterbacher, both of Ketsch, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

Filed Jan. 29, 1981, Ser. No. 229,767

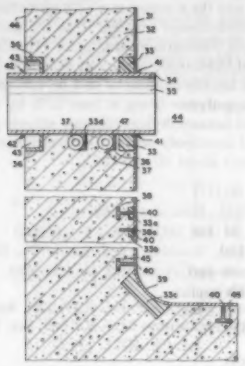
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009826

Int. Cl.³ G21C 13/04

U.S. Cl. 376—296 16 Claims

1. A pressure vessel for a nuclear reactor installation comprising a reinforced concrete vessel, at least one open area located in the wall of said concrete vessel, lining means immediately adjacent the surfaces of said open area for protection of said surfaces and anchored in the wall of said concrete vessel, said lining means being directly contacted by the cooling medium of the nuclear reactor and a space between the concrete of said concrete vessel and said lining means which is

void of concrete in at least one particular area, said space being of a dimension to permit movement of said lining means independent of the concrete and to permit directed distribution of stresses in said lining means.



4,477,410

DEVICE FOR COOLING THE MAIN VESSEL OF A FAST FISSION NUCLEAR REACTOR

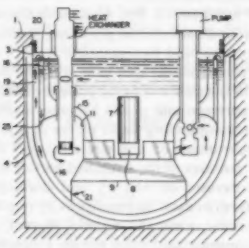
Michel Debru, Massy, France, assignor to Novatome, Le Plessis Robinson, France

Filed Mar. 29, 1982, Ser. No. 362,823

Claims priority, application France, Apr. 30, 1981, 81 08638

Int. Cl.³ G21C *15/00*

U.S. Cl. 376—404 **3 Claims**



1. A device for cooling the main vessel (**3**) of an integrated-type fast fission nuclear reactor comprising a vessel with a symmetry of revolution about a vertical aixs, referred to as the main vessel, which contains a cooling liquid and inside which are arranged the reactor core (**7**), a plurality of pumps for circulating the cooling liquid, and a plurality of heat exchangers using the cooling liquid as the primary fluid, a partition (**10**), with a symmetry of revolution about the axis of the vessel, arranged at a predetermined height in said vessel (**3**) and at the periphery of said core (**7**), creating in said vessel two separate zones, a first of said zones (**14**) containing said core (**7**) and the sodium heated in contact therewith, which leaves said first zone through an inlet for primary fluid in said heat exchangers, in which the outlet for primary fluid is located in the second of said zones (**15**), containing the liquid cooled by said heat exchangers, which is carried away by said pumps and injected into the lower part of said core, and at least two shells comprising outer and inner shells (**16, 17**) coaxial with said main vessel (**3**) and arranged inside the latter over a predetermined height above said partition (**10**), creating between them, and between the shell (**16**) of larger diameter, or external shell, and said vessel (**3**), at least two annular spaces (**19, 20**) for the passage of said cooling liquid, one of which emerges in the lower part of said core (**7**) and the other in said second zone (**15**), said two annular spaces furthermore being in communication, in their upper part, with a zone (**24**) located in the upper part of said vessel and filled with inert blanketing gas, in which cooling device the annular space (**19**) delimited by said main vessel (**3**) and said external shell (**16**), or external space, is in communication with said second zone (**15**) containing cooled liquid, and the internal space (**20**) delimited between the two shells (**16, 17**) is in communication, via at least one tube (**31, 35**), with the lower part of said core (**7**), into which said cold liquid is injected, part of which is thus caused to circulate from bottom to top in the second space (**20**) before flowing into the external space (**19**), at the level of the upper zone (**24**) of said vessel occupied by said blanket of gas, and moving down again, by gravity, to the lower part of said core, remaining in contact with the internal surface of said main vessel (**3**) and thus cooling the latter.

4,477,411

NUCLEAR REACTOR FUEL ELEMENTS

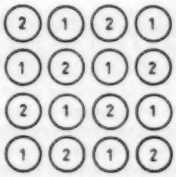
Edward D. Hindle, St. Annes, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed May 26, 1981, Ser. No. 267,014

Claims priority, application United Kingdom, May 29, 1980, 8017597

Int. Cl.³ G21C *3/02*

U.S. Cl. 376—412 **5 Claims**



1. In an array of rods comprising zirconium alloy sheathed nuclear fuel pellets, assembled to form an unirradiated fuel element for a pressurized water reactor and including helium gas within each rod, the improvement wherein the helium gas pressure within each rod differs in the same relative sense from that of its closest neighboring rods, such that said closest neighboring rods are all either at a higher helium gas pressure or at a lower helium gas pressure than said each rod.

4,477,412

SURFACE-AREA STABILIZATION OF FUMED SILICA

Marylu B. Gibbs, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 14, 1980, Ser. No. 111,746

Int. Cl.³ C01B *33/18*

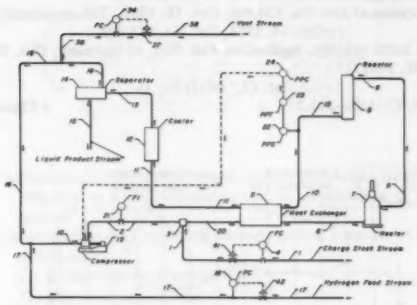
U.S. Cl. 422—40 **6 Claims**

1. A method for reducing the surface-area decay of fluoride-containing fumed silica during storage, comprising the step of providing an atmosphere of an inert gas in which the fumed silica is disposed, said inert gas having a water vapor content of about 0.2 grams per kilogram of gas or less.

4,477,413
UTILITY CONSERVATION IN HYDROGEN RECYCLE PROCESSES

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed May 4, 1982, Ser. No. 374,857
Int. Cl.³ B01J *8/00*; C10G *47/36*; G01N *35/00*
U.S. Cl. 422—62 9 Claims



1. A control system for modifying the flow of hydrogen in a hydrocarbonaceous conversion apparatus, which apparatus comprises:

(a) a charge stock stream inlet conduit in interconnection with a vaporous hydrocarbon-hydrogen recycle stream conduit;

(b) a reaction zone for reacting hydrocarbonaceous materials contained within said charge stock stream to a converted hydrocarbon product stream;

(c) a reaction zone effluent conduit having a hydrogen partial pressure sensor therein;

(d) a cooling zone for cooling said effluent stream to provide via condensing in liquid hydrocarbon product stream and at least a portion of said vaporous hydrocarbon-hydrogen recycle stream;

(e) a cooling zone effluent conduit in communication with a gas-liquid separation zone, said gas-liquid separation zone effective to exorcise said liquid hydrocarbon product stream from said vaporous hydrocarbon-hydrogen recycle stream; and

(f) a compressor means having variable output capability in communication with said separation zone and said recycle stream conduit of step (a); said control system consisting of:

(i) means for sensing the partial pressure of hydrogen at a point downstream of said reaction zone of step (b) in said reaction zone effluent conduit;

(ii) comparison means for comparing said partial pressure of hydrogen to a previously determined value and developing a signal correlating thereto;

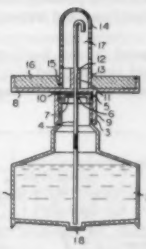
(iii) transmission means for transmitting said signal of step (ii) to said variable output compressor; and

(iv) regulation means for controlling the quantity of vaporous hydrocarbon and hydrogen recycled to said reaction zone via said recycle stream conduit based on the partial pressure sensed in said step (i).

4,477,414
EVAPORATIVE CONTAINER

Takayoshi Muramoto; Shingi Nishino; Toshiyuki Sasaki, and Takanori Sasaki, all of Hiroshima, Japan, assignors to Fumakilla Limited, Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,237
Claims priority, application Japan, May 20, 1981, 56-74830; May 20, 1981, 56-71915[U]; May 20, 1981, 56-71916[U]
Int. Cl.³ A61L *9/02*, *9/04*
U.S. Cl. 422—125 22 Claims



1. An evaporative apparatus for evaporating a solution in constant proportion of the solution ingredients comprising:

(a) a container for said solution having a body portion with an upwardly-extending central neck portion;

(b) support means for supporting an impregnation member comprising an impregnation member supporting plate sealingly mountable on the neck portion of the container to form a first enclosed space within the body of the container;

(c) a closed cylindrical tubular member vertically extending from said supporting plate and defining a second enclosed space therewith;

(d) an impregnation member of a liquid-absorbing material for impregnation with solution to be evaporated disposed around said cylindrical tubular member;

(e) a capillary feed tube vertically extending from the bottom of the body portion of the container into the second enclosed space through a central bore in said supporting plate for delivering solution in the container to the second enclosed space;

(f) actuating means for initiating flow of solution through said feed tube into said second enclosed space by establishing a pressure differential between said enclosed spaces;

(g) vacuum-breaking passage means for communicating the atmosphere with the first enclosed space after initiation of solution flow to maintain solution in the container at atmospheric pressure during evaporative operation of the apparatus; and

(h) communication means for communicating solution from said second enclosed space to said impregnation member while maintaining the second enclosed space at a pressure sufficiently reduced below atmospheric pressure to maintain flow of solution through the tube during evaporative operation of the apparatus.

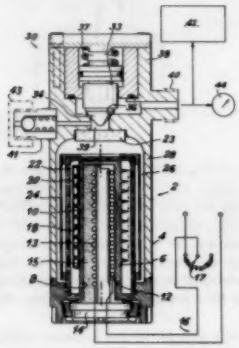
4,477,415
APPARATUS FOR STORING AND PRODUCING HYDROGEN FROM A SOLID COMPOUND

Jean C. Fecan, Merignac, and Jean Morin, Antony, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 21, 1982, Ser. No. 380,714
Claims priority, application France, Jun. 2, 1981, 81 10882
Int. Cl.³ C01B *3/50*, *3/56*
U.S. Cl. 422—164 9 Claims

1. An apparatus for the storage and production of hydrogen comprising:

a sealed container having hydrogen inlet means and hydrogen outlet means;
a metallic support within said container having an outer face and being of a generally tube-like shape, and having at least one rib on its outer face;
a solid compound able to selectively fix hydrogen by hydrogenation and release hydrogen upon heating thereof, wherein said solid compound is a machineable mass of compacted powder shaped and positioned to surround said outer face of said metallic support and mechanically engages said at least one rib and thereby is mounted on said support in a fixed position relative thereto;
a filter in said container and surrounding said solid compound;
said solid compound in said fixed position being disposed intermediate said support and said filter; and
heating means inside said metallic support.



9. An apparatus for the storage and production of hydrogen comprising:
a sealed container having hydrogen inlet means and hydrogen outlet means;
a metallic cylindrical support within said container having an outer face, and having at least one rib on its outer face;
a solid compound of at least one rare earth and a metal of group VIII of the periodic system, which is able to fix hydrogen by hydrogenation and release hydrogen upon heating thereof, said rib being helical and said solid compound being in the form of a cylindrical mass which is internally threaded and being positioned to surround said metallic support to engage said rib on the outer face thereof;
a filter in said container and surrounding said solid compound; and
heating means inside said metallic support.

4,477,416

SALT ROASTING OF VANADIUM ORE IN THE PRESENCE OF CARBON

John B. Goddard, Grand Island, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 27, 1982, Ser. No. 424,641
Int. Cl.³ C01G *31/00, 31/02*
U.S. Cl. 423—67 **15 Claims**

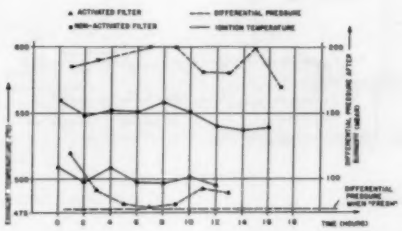
1. A process for extracting vanadium values from a vanadium-bearing ore which comprises, in combination:
preparing a finely divided mixture of the vanadium-bearing ore, a carbonaceous material selected from the group consisting of charcoal, coke, and nonvolatile carbonaceous residues derived from the combustion of petroleum, and an alkali metal salt;
roasting the mixture so prepared in an oxidizing atmosphere at an elevated temperature sufficient to oxidize the vanadium-bearing ore and produce water soluble vanadium values, and for a period of time sufficient to burn off substantially all of the carbon in the mixture;
water-leaching the roast residue to dissolve the soluble vanadium values; and
recovering the soluble vanadium values.

4,477,417

CATALYST FOR REDUCING THE IGNITION TEMPERATURE OF DIESEL SOOT

Rainer Domesle, Maintal; Herbert Völker, Hanau; Edgar Koberstein, Alzenau, and Hans-Dieter Pletka, Freigericht, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 434,806, Oct. 18, 1982,. This application Oct. 14, 1983, Ser. No. 542,313
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1981, 3141713
Int. Cl.³ B01D *53/36*
U.S. Cl. 423—213.2 **4 Claims**



1. A process for the reduction of the ignition temperature of diesel soot filtered out of the exhaust of diesel engines comprising passing the exhaust stream through a filter element, the filter element being a temperature-resistant inert support onto which is deposited a catalytically effective amount of silver vanadate or a mixture of a temperature resistant carrier material and a catalytically effective amount of silver vanadate.

4,477,418

PROCESS FOR ADSORPTION

Joseph T. Mullhaupt, Williamsville, and Oren E. Berwaldt, Youngstown, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 23, 1983, Ser. No. 525,716
Int. Cl.³ C01B *13/00*
U.S. Cl. 423—219 **5 Claims**

1. In a process for the separation of oxygen from a gas stream by adsorption, the improvement comprising using, as the adsorbent, a compound having the formula $M_x[M'(CN)_6]_y$
wherein M is an element having an atomic number of 21, 25 to 30, 39, 50, or 57 to 59;
M′ is an element having an atomic number from 24 to 27; and
x and y are positive whole numbers such that the sum of the valence of M times x plus the valence of $[M'(CN)_6]$ times y is equal to zero.

4,477,419

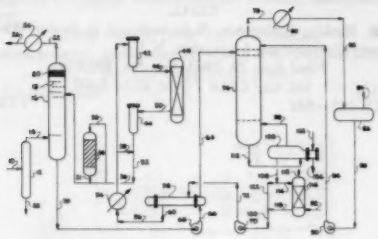
PROCESS FOR THE RECOVERY OF CO_2 FROM FLUE GASES

Roscoe L. Pearce, Lake Jackson; Richard A. Wolcott, Angleton, and Charles R. Pauley, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 3, 1983, Ser. No. 471,626
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—228 **42 Claims**

1. In a process for the recovery of carbon dioxide from feed

gases containing the same and oxygen which may also contain sulfur compounds, by contacting the gas with a circulating alkanolamine solution containing copper and treating said solution rich in CO_2 with heat to release the CO_2 thereby producing a lean solution and returning the so treated lean solution to the contacting step, the improvement which comprises



maintaining an amount of copper in said circulating solution effective to inhibit corrosion; and/or degradation of the solvent

by contacting the circulating solution with at least one of the following

(1) at least one mechanical filter;

(2) activated carbon bed;

(3) a strong base anion exchange resin; and/or

(4) any combination thereof.

4,477,420

PROCESS FOR SEPARATING, ESPECIALLY IN MULTIPLE STAGES, ACID COMPONENTS SUCH AS CO_2, HCN AND SPECIFICALLY H_2S, FROM GASES, ESPECIALLY FROM COKE OVEN GASES, BY MEANS OF AMMONIA RECIRCULATION SCRUBBING

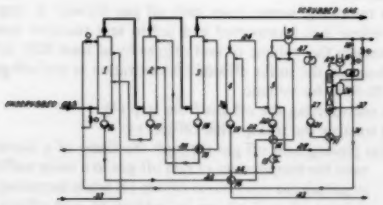
Hartmut K. Bauer, Essen, and Ernst A. W. Otte, Mülheim, both of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 285,833, Jul. 22, 1981, abandoned. This application Jul. 21, 1982, Ser. No. 400,375

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1980, 3030435

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—234 **11 Claims**



1. In a process for separating acid components from gases in multiple stages by ammonia recirculation scrubbing wherein the ammonia bound to the acid components during scrubbing is released by a deacidification step to produce an ammonia condensate, the improvement comprising the steps of:

stripping said ammonia condensate to produce substantially pure liquid ammonia, and

recirculating said liquid ammonia to at least one stage of the scrubbing process.

4,477,421

PROCESS FOR THE STABILIZATION OF AQUEOUS CYANAMIDE SOLUTIONS

Stefan Weiss, Trostberg, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed May 10, 1983, Ser. No. 493,385

Claims priority, application Fed. Rep. of Germany, May 21, 1982, 3219054

Int. Cl.³ C01C *3/18*

U.S. Cl. 423—275 **10 Claims**

1. A process for increasing the storage stability of an aqueous solution containing 20 to 80% by weight cyanamide, comprising mixing the aqueous cyanamide solution with 0.005 to 0.5% by weight of divalent magnesium cations, based on the cyanamide solution, in the form of at least one inorganic and/or organic magnesium salt.

4,477,422

REDUCING SLURRY VISCOSITY OF KAOLINITIC CLAYS

Michael W. Ginn, 1222 Chennault Dr., Dublin, Ga. 31021

Continuation-in-part of Ser. No. 428,015, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 327,703, Dec. 8, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 451,339

Int. Cl.³ C01B *33/26, 33/02*

U.S. Cl. 423—327 **25 Claims**

1. A process of reducing the viscosity of a raw kaolinitic clay slurry, said slurry being made from a clay that is contaminated with degraded illite and has a low shear viscosity of at least about 1000 centipoises, as determined by TAPPI Procedure No. T 648 su-72 with the pH of the slurry at the point within the range of about 6 to 8 at which the slurry exhibits the lowest low shear viscosity, by

(a) admixing said slurry with a source of cationic potassium in a ratio of about 1 to 10 pounds of the potassium source (calculated as cationic potassium) per ton of the clay (dry weight basis), said potassium source being a water-soluble potassium compound;

(b) heating the mixture of clay, potassium source and water to a temperature of about 100° to 300° C. either (i) by drying the slurry at a temperature of about 100° to 300° C., without calcining the clay, and then reslurrying the clay in water, or (ii) heating the slurry to a temperature of about 100° to 300° C. without drying or calcining the clay; and

(c) recovering a kaolinitic clay slurry having a low shear viscosity substantially lower than that of the raw clay slurry, when measured at the same solids content.

4,477,423

ZEOLITE Y

Robert N. Sanders, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 299,885, Sep. 8, 1981, abandoned. This application Apr. 28, 1983, Ser. No. 489,478

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—328 **5 Claims**

1. A method of improving the crystallinity of zeolite Y, comprising the steps of,

(a) making a water slurry of the zeolite Y to be treated;

(b) adding a sufficient quantity of acid to adjust the pH of the zeolite Y-water slurry to about 7 to 8;

(c) refluxing the slurry for a sufficient period of time to substantially increase the crystallinity of the zeolite Y;

(d) separating the solids from the slurry;

(e) drying the solids, and

(f) recovering a zeolite Y product of improved crystallinity.

4,477,424
CONTINUOUS PREPARATION OF HYDROXYLAMMONIUM SALTS

Otto-Alfred Grosskinsky; Elmar Frommer, both of Ludwigshafen, Fed. Rep. of Germany; Günther Rapp, late of Ludwigshafen, Fed. Rep. of Germany (by Ruth E. Rapp, legal representative), and Erwin Thomas, Freinsheim, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,614

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107702

Int. Cl.³ C01B *21/20*

U.S. Cl. 423—387 **1 Claim**

1. In a process for the continuous preparation of hydroxylammonium salts by the catalytic reduction of nitric oxide with hydrogen in a dilute aqueous solution of a mineral acid in the presence of a suspended noble metal catalyst at an elevated temperature in from 4 to 8 reaction zones connected in series, the improvement comprising: continuously monitoring the pH in the last reaction zone and, in response thereto, adding sufficient fresh aqueous acid to the first reaction zone to maintain the pH in the last reaction zone between 0.9 and 1.8, whereby the increased formation of by-products and an excessive content of mineral acid is avoided in the last reaction zone.

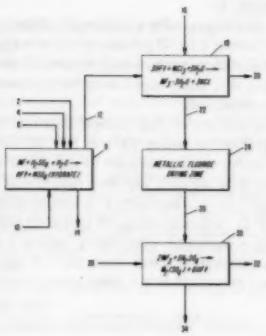
4,477,425
PRODUCTION OF ANHYDROUS HYDROGEN FLUORIDE FROM LOW-GRADE METALLIC FLUORIDES AND SULFURIC ACID

William W. Berry, Winter Haven; Robert A. Ashworth, Tampa, and Ned B. Spake, Winter Park, all of Fla., assignors to Florida Progress Corporation, St. Petersburg, Fla.

Filed Dec. 15, 1983, Ser. No. 561,788

Int. Cl.³ C01B *7/19*

U.S. Cl. 423—485 **13 Claims**



1. A process for the production of anhydrous hydrofluoric acid from low-grade sources of fluorine comprising:
   (a) reacting a low grade source of fluorine comprised of a metallic fluoride with sulfuric acid in a reaction zone at a temperature ranging from about 140° to 220° C. to produce hydrogen fluoride and hydrated metallic sulfate;
   (b) recovering said hydrogen fluoride formed in step (a);
   (c) reacting said recovered hydrogen fluoride with a metallic salt of a metal in the form of an aqueous solution thereof which metal forms slightly soluble or insoluble fluorides at a temperature ranging from about ambient to about 120° C. to produce a hydrated metallic fluoride and a corresponding acid;
   (d) recovering said hydrated metallic fluoride from step (c) as a precipitate and heating said metallic fluoride to a temperature sufficient to remove bound water;
   (e) reacting said dehydrated metallic fluoride from step (d) with sulfuric acid at a temperature ranging from about 70° to about 120° C. to produce anhydrous hydrofluoric acid and a metallic sulfate; and
   (f) recovering said anhydrous hydrofluoric acid.

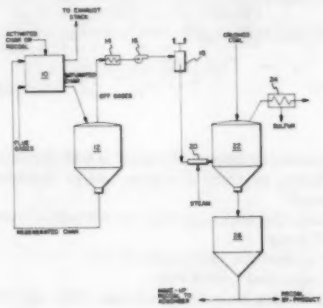
4,477,426
PROCESS FOR PREPARING A SULFUR DIOXIDE CONTAINING GAS STREAM FOR REACTION WITH COAL

Neil R. Raskin, Livingston, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Apr. 29, 1983, Ser. No. 490,078

Int. Cl.³ C01B *17/04*; B01J *8/00*

U.S. Cl. 423—569 **7 Claims**



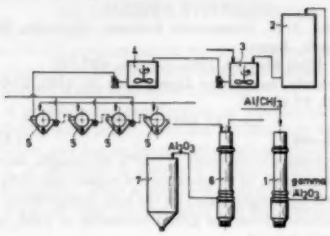
1. In a gas desulfurization process comprising the steps of
   (1) contacting flue gases containing sulfur oxides with activated char so that the sulfur oxides are absorbed in the porous system of the char and oxidized to sulfuric acid by the oxygen and water vapor present in the gas stream;
   (2) regenerating the saturated char formed in step (1) in a regeneration zone to decompose the sulfuric acid to sulfur dioxide and water and form an off-gas containing 20%–30% by volume of sulfur dioxide and 70%–80% by volume of water;
   (3) feeding the off-gas formed in step (2) to a reaction zone containing coal and maintained at an elevated temperature sufficient to convert the sulfur dioxide in said off-gas to gaseous elemental sulfur and to partially oxidize the coal, said reaction zone being located a distance from said regeneration zone sufficient to require significantly large sized equipment to feed the off-gas from said regeneration zone to said reaction zone; the improvement which comprises;
   (4) removing water from said off-gas formed in step (2) before it is transported and fed to said reaction zone to reduce the volume of said off-gas by at least 50% and to increase the sulfur dioxide concentration in said off-gas to 70–90% by volume;
   (5) transporting the off-gas from step (4);
   (6) treating the transported off-gas by:
      (a) passing said off-gas through the flame of a burner to raise the temperature of said off-gas to a value sufficient to permit the conversion of step (3) while increasing the volume of said off-gas by adding to said off-gas the combustion gas and water resulting from combustion at said burner, and by raising its temperature, the increased water being insufficient to permit said conversion, and
      (b) mixing steam with the off-gas from step (5) to increase the water content of said off-gas to a value sufficient to permit the conversion of step (3) while maintaining the temperature of said off-gas at a value sufficient to permit said conversion; and
   (7) feeding said treated off-gas to said reaction zone.

4,477,427

PROCESS FOR THE PREPARATION OF ALKALI-POOR α-ALUMINA FOR CERAMIC PURPOSES

József Mátyasi; György Kaptay; László Zsembery, all of Almásfüzito-felso; Béla Kökény, Komárom; József T. Tóth, Almásfüzito-felso; Mária Tóth Née Hömöstrei, Almásfüzito-felso, and Imre Pénzes, Almásfüzito-felso, all of Hungary, assignors to Magyar Aluminiumipari Troeszt, Budapest, Hungary

Filed Nov. 9, 1982, Ser. No. 440,260
Claims priority, application Hungary, Nov. 10, 1981, 3358/81
Int. Cl.[3] C01F 7/30, 7/02
U.S. Cl. 423—628 6 Claims



1. Process for the preparation of alkali-poor α-alumina for ceramic purposes, comprising

(a) activating technical grade aluminum hydroxide by heating it to a temperature of 500°–600° C.,

(b) washing the activated product with alkali-free water containing calcium ions and having a conductivity not exceeding 70 μs/cm until the alkali content expressed in Na_2O becomes lower than 0.15% by weight, and

(c) calcinating the same in the presence of a mineralizing mixture comprising halides and boron compounds.

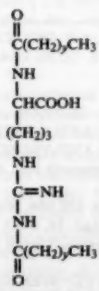
4,477,428

ORAL COMPOSITIONS COMPRISING N^{α},N^{G}-DIACYL DERIVATIVES OF ARGININE

Steven B. Silbering, Plainsboro, and Tibor Sipos, Lebanon, both of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

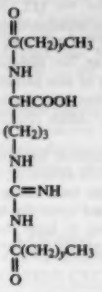
Filed Aug. 26, 1982, Ser. No. 412,041
Int. Cl.[3] A61K 7/22; C07C 129/12
U.S. Cl. 424—52 23 Claims

1. N^{α},N^{G}-diacyl derivatives of arginine having the formula:



where y is an integer of from 0 to 28, and the pharmaceutically acceptable salts thereof.

8. A composition of matter for oral hygiene to inhibit acid production by microorganisms in the oral cavity comprising an effective amount, in a pharmaceutically acceptable carrier, of an N^{α},N^{G}-diacyl derivative of arginine having the formula;



wherein y is an integer of from 0 to 28, or a pharmaceutically acceptable salt thereof.

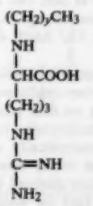
4,477,429

ORAL COMPOSITIONS COMPRISING N^{α}-ALKYL DERIVATIVES OF ARGININE

Steven B. Silbering, Plainsboro, and Tibor Sipos, Lebanon, both of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

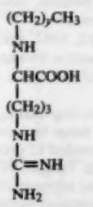
Filed Aug. 26, 1982, Ser. No. 412,331
Int. Cl.[3] A61K 7/22; C07C 129/12
U.S. Cl. 424—52 18 Claims

1. N^{α}-alkyl derivatives of arginine having the formula:



where y is an integer of from 6 to 29, and the pharmaceutically acceptable salts thereof.

5. A composition of matter for oral hygiene to inhibit acid production by microorganisms in the oral cavity comprising an effective amount, in a pharmaceutically acceptable carrier, of an N^{α}-alkyl derivative of arginine having the formula:



wherein y is an integer of from 6 to 29, or a pharmaceutically acceptable salt thereof.

4,477,430

LIQUID BASE MAKEUP COMPOSITION

Lawrence J. Liff, 2402 E. Cheryl, Phoenix, Ariz. 85028

Continuation-in-part of Ser. No. 111,354, Jan. 11, 1980, Pat. No. 4,349,535, which is a continuation-in-part of Ser. No. 909,576, May 25, 1978, Pat. No. 4,183,898. This application Aug. 3, 1982, Ser. No. 404,822

The portion of the term of this patent subsequent to Sep. 14, 1999, has been disclaimed.

Int. Cl.³ A61K *7/021, 47/00*

U.S. Cl. 424—63 2 Claims

1. A liquid base formulation for multiple makeup uses consisting of about 2.0 to 3.0% cellulous; 0.2 to 0.3% quaternium-15; and the balance of the total being water; said percentages being by weight and based upon the total formulation weight; said quaternium-15 acting to keep the formulation free from unwanted bacteria; the pH of the formulation being between 7.0 and 9.5.

4,477,431

COSMETIC COMPOSITION CONTAINING HIGH LEVELS OF POWDER

Robert Suffis, Randolph, and Myron Barchas, Montclair, both of N.J., assignors to The Mennen Company, Morristown, N.J.

Filed Jan. 14, 1981, Ser. No. 225,005

Int. Cl.³ A61K *7/34, 7/38, 7/035*

U.S. Cl. 424—66 9 Claims

1. A viscous, flowable, non-alcoholic, anhydrous cosmetic composition consisting essentially of, by weight of total product, about 35 to about 70% cosmetic powder, about 1 to about 20% inorganic gelling agent, about 1 to about 10% surfactant selected from the group consisting of nonionic, cationic and mixtures thereof and about 19 to about 45% cosmetically acceptable oil.

4,477,432

ORAL IMMUNE GLOBULIN

W. Richard Hardie, Walnut Creek, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 259,758, May 1, 1981, abandoned. This application Apr. 5, 1982, Ser. No. 365,759

Int. Cl.³ A61K *45/00*

U.S. Cl. 424—85 3 Claims

1. A method of prevention or treatment of enteric infections in humans which comprises orally administering to a patient a composition comprising an oral pharmaceutical composition having therapeutic effectiveness toward enteric infections containing in a pharmaceutically acceptable carrier about 5–20% by weight of an orally administerable hepatitis-safe, human blood fractionation derived immune globulin containing not less than 70% IgG by weight and about 1–20% by weight of a carbohydrate and having a pH of about 4–8.

4,477,433

METHOD OF PROTECTING BUSHES, TREES AND LIKE PLANTS AGAINST ATTACK BY PATHOGENIC FUNGI; A FUNGICIDE FOR CARRYING OUT THE METHOD; AND A METHOD OF PRODUCING THE FUNGICIDE

Rolf Ö. Hultman, Bro, Sweden, assignor to Miljokonsult Rolf Hultman AB, Bro, Sweden

Filed Feb. 11, 1982, Ser. No. 348,134

Claims priority, application Sweden, Feb. 19, 1981, 8101113

Int. Cl.³ A01N *63/00;* A61K *37/00;* C12N *1/14*

U.S. Cl. 424—93 8 Claims

1. A method of protecting plants, bushes and trees against attack from pathogenic fungi by treating the soil in which the plant, bush or tree is intended to grow with fungi antagonistic towards the pathogenic fungus, wherein the improvement comprises cultivating the antagonistic fungus on a cultivating substrate comprising compost material obtained by biologically decomposing organic compostible material and treating compostible material at a temperature of at least about 70° C. over a period of at least about 2 calendar days to kill microorganisms which inhibit the cultivation of the antagonistic fungus.

4,477,434

MEDICINAL COMPOSITIONS, FOODS AND BEVERAGES HAVING THERAPEUTIC EFFECTS ON DISEASES OF CIRCULATORY SYSTEM AND DIGESTIVE SYSTEM

Reiko Kosaka, 3/27, Hannan-cho 6-chome, Abeno-ku, Osaka-shi, Osaka-fu, Japan

Filed May 23, 1983, Ser. No. 497,029

Claims priority, application Japan, May 29, 1982, 57-91794; Jul. 15, 1982, 57-124237

Int. Cl.³ A61K *37/48*

U.S. Cl. 424—94 11 Claims

1. A composition comprising 0.5–20% by weight, based on the total composition, of an admixture of papain and citric acid; and 99.5–80% by weight, based on the total composition, of an ingredient selected from the group consisting of food, beverage or mixture thereof.

4,477,435

METHOD FOR REGENERATING CORNEAL EPITHELIUM

Yves Courtois, Gif sur Yvette; Denis Barritault, and Yves Pouliquen, both of Paris, all of France, assignors to Institut National de la Sante et de la Recherche Medicale (INSERM), Paris, France

Continuation of Ser. No. 265,194, May 19, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,798

Int. Cl.³ A61K *35/12*

U.S. Cl. 424—95 4 Claims

1. A method for regenerating wounded or damaged corneal epithelium, comprising the step of: contacting said epithelium in vivo with a therapeutically effective amount of an aqueous salt extract of ocular tissue.

4,477,436

COMPOSITION FOR AND A METHOD OF TREATING HAIR AND/OR SCALPS

Dorothy Gleave, 33 Chatsworth Rd., St. Annes-on-Sea, Lancashire, England

Continuation of Ser. No. 325,966, Nov. 30, 1981, abandoned. This application Apr. 14, 1983, Ser. No. 484,963

Claims priority, application United Kingdom, Feb. 12, 1980, 8038551

Int. Cl.³ A61K *35/12*

U.S. Cl. 424—95 5 Claims

1. A composition comprising 20 to 40% by weight beef bone marrow, 10 to 30% by weight castor oil, 1 to 5% by weight paraffin oil, 20 to 40% by weight rum, 1 to 10% by weight emulsifying white wax, and 1 to 15% by weight rosemary.

4,477,437

SUBSTANCES HAVING CARCINOSTATIC AND IMMUNOSTIMULATING ACTIVITY

Kenzo Tamai, Kanazawa; Isamu Saikawa, Toyama; Takashi Yasuda, Toyama; Shohachi Murakami, Toyama; Toyoo Maeda, Kanazawa; Hisatsugu Tsuda, Toyama; Hiroshi Sakai, Takaoka; Masatoshi Sugita, Toyama; Yoshiko Yamamoto, Namekawa; Hisashi Minami, and Takako Hori, both of Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1982, Ser. No. 347,871

Claims priority, application Japan, Feb. 19, 1981, 56-22270; Feb. 19, 1981, 56-22271; Feb. 19, 1981, 56-22272; Feb. 19, 1981, 56-22273; Feb. 19, 1981, 56-22274; Feb. 19, 1981, 56-22275; Feb. 19, 1981, 56-22276; Feb. 19, 1981, 56-22277

Int. Cl.³ A61K *31/715;* C08B *37/00*

U.S. Cl. 424—116 12 Claims

1. A TF-210 product having the following properties, or an alkali metal or an alkaline earth metal salt thereof:

(a) grayish white-light brown powder;

(b) it prohibits the proliferation of Ehrlich ascites tumor, Ehrlich solid tumor, Sarcoma 180 and B-16 Melanoma of mouse, and has an immunostimulating activity;

(c) it is insoluble in methanol, ethanol, acetone, benzene, chloroform, ethyl acetate and diethyl ether;

(d) it has no clear melting point and decomposes at 160° to 235° C.;

(e) its infrared absorption spectrum obtained by a KBr tablet method has absorption bands at approximately 3600–3200, 2950–2920, 1680–1620, 1550–1510, 1440, 1380, 1240–1220 and 1120–1020 cm^{-1};

(f) the ultraviolet absorption spectrum of an aqueous solution of its water-soluble fraction at a pH of 7.0 shows a strong absorption at the absorption edge, and shows an absorption peak at approximately 248–265 nm;

(g) it is positive in Molisch reaction, phenolsulfuric acid reaction, anthrone-sulfuric acid reaction, indole-hydrochloric acid reaction and Lowry-Folin's reaction;

(h) has elementary analysis values of C: 40–43% H: 5–7% N: 9–10%; and

(i) the saccharide content of the water-soluble fraction at a pH of 7 as determined by a phenolsulfuric acid method is between about 5–25% by weight in terms of glucose, and the protein content determined by Lowry-Folin's method is between about 20–50% by weight in terms of bovine serum albumin.

4,477,438

HYDROGEN PEROXIDE COMPOSITION

George W. Willcockson, deceased, late of Dallas, Tex. (by Beth E. Willcockson, executrix), and David C. F. Law, Arlington, Tex., assignors to Surgikos, Inc., Arlington, Tex.

Filed Nov. 12, 1982, Ser. No. 441,006

Int. Cl.³ A01N *59/00;* A61K *33/40*

U.S. Cl. 424—130 4 Claims

1. An aqueous disinfecting solution having a buffered pH of from 4 to 6.0 and which is not corrosive to surgical instruments comprising from 4% to 6% by weight hydrogen peroxide, from 0.1% to 0.3% by weight of an anionic surfactant selected from the group consisting of sodium lauryl sulfate and sodium n-decyl diphenylether disulfonate; from 0.1% to 0.3% by weight of a sarcosinate surfactant selected from the group consisting of sodium cocoyl sarcosinate and sodium lauryl sarcosinate; 0.1% by weight of a soluble zinc compound selected from the group consisting of zinc sulfate, zinc acetate, zinc nitrate and zinc gluconate and from 0.1% to 0.3% by weight of a nitrogen containing chelating agent selected from the group consisting of N-(hydroxyethyl) ethylenediamine triacetic acid, ethylenediamine tetracetic acid and diethylenetriamine pentaacetic acid.

4,477,439

TREATMENT OF IRRITATED AND EXCORIATED AREAS AROUND THE STOMA OF OSTOMY PATIENTS

Gaetano F. D'Alelio, deceased, late of South Bend, Ind. (by St. Joseph Bank & Trust Co., Executor), assignor to Walter J. Monacelli, St. Petersburg, Fla., a part interest

Filed Apr. 13, 1981, Ser. No. 253,602

Int. Cl.³ A61K *33/04, 33/06, 33/30, 33/42*

U.S. Cl. 424—162 8 Claims

1. A process for the external treatment of irritated areas of skin around the stoma of an ostomy patient comprising the external application of a finely divided alkaline earth metal salt selected from the class consisting of sulfates of barium, calcium, and strontium.

4,477,440

RENIN INHIBITORS CONTAINING AN N-TERMINAL DISULFIDE CYCLE

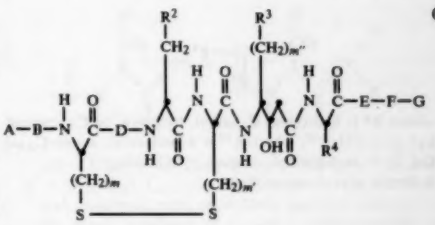
Joshua S. Boger, Bryn Mawr, and Daniel F. Veber, Ambler, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 14, 1983, Ser. No. 531,968

Int. Cl.³ A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 8 Claims

1. A peptide of the formula:

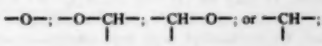


(I.)

wherein:

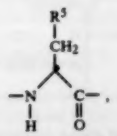
A is hydrogen; or

where X is



and R_a^1 and R_b^1 may be the same or different and are hydrogen; Y—$(CH_2)_n$—where Y is C_{1-4}alkyl; hydrogen; aryl; C_{3-7}cycloalkyl; or C_{3-7}cycloalkyl or aryl substituted with up to five members independently selected from the group consisting of C_{1-3}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo; n is 0 to 5; except that where X is —O—, only one of R_a^1 or R_b^1 is present;

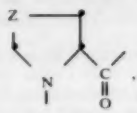
B is absent; glycyl; sarcosyl; or



where R^5 is hydrogen; C_{1-4} alkyl; hydroxy C_{1-4} alkyl; aryl; aryl substituted with up to three members selected from the

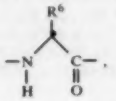
group consisting of C_{1-4}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and; halo; indolyl; 4-imidazolyl; amino C_{2-4} alkyl; guanidyl C_{2-3} alkyl; or methylthiomethyl;

D is

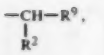


where Z is $-(CH_2)_p-$ and p is 1 or 2; or —S—;

E is absent; or

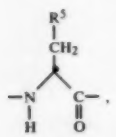


where R^6 is hydrogen;



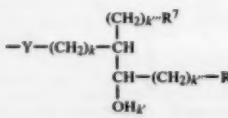
where R^9 is hydrogen, C_{1-4}alkyl, hydroxy, or C_{3-7}cycloalkyl; or $-CH_2R^{10}$, where R^{10} is 4-imidazolyl, amino-C_{2-4}alkyl, 2-, 3- or 4-pyridyl, or guanidyl-C_{2-3}alkyl;

F is absent; glycyl; sarcosyl; or



where R^5 is as defined above;

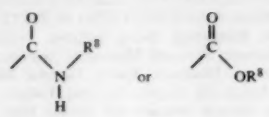
G is OR; NHR; $N(R)_2$, where each R may be the same or different and is hydrogen; or C_{1-4}alkyl; or, when E and/or F are absent, G may be (1) $-Y-(CH_2)_q-R^7$ where Y is —NH— or —O—; q is 0 to 5; and R^7 is hydrogen; hydroxy; C_{1-4}alkyl; C_{3-7}cycloalkyl; aryl; aryl substituted with up to five members independently selected from the group consisting of C_{1-6}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, amino, mono- or diC_{1-4}alkylamino, and halo; amino; mono-, di- or tri-C_{1-4}alkylamino; guanidyl; heterocyclic; or heterocyclic substituted with up to five members independently selected from the group consisting of C_{1-6}alkyl, hydroxy, trifluoromethyl, C_{1-4}alkoxy, halo, aryl, aryl-C_{1-4}alkyl, amino, and mono- or di-C_{1-4}alkylamino;



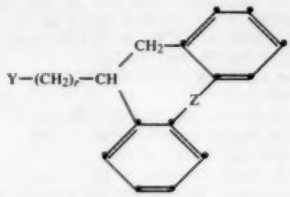
(2)

where Y is as defined above; k is 0 or 1; k' is 0 or 1; k'' is 1 to 4; k''' is 1 to 4; and

R^7 and R_a^7 may be the same or different and have the same meaning as R^7 above and R_a^7 may additionally be

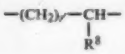


where R^8 is hydrogen or C_{1-3}alkyl; or



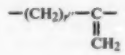
(3)

where Y is as defined above; r is 0 or 1; and Z is



(a)

where r' is 0 or 1; and R^8 is a defined above; or



(b)

where r'' is 0 or 1;

R^2 is hydrogen; C_{1-4}alkyl; aryl; aryl substituted with up to three members selected from the group consisting of C_{1-4}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo; or indolyl;

R^3 is C_{3-6} alkyl; C_{3-7} cycloalkyl; aryl; or C_{3-7}cycloalkyl or aryl substituted with up to three members selected from the group consisting of C_{1-4}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo;

R^4 is hydrogen; or

where R^{11} is hydrogen; C_{1-4}alkyl; hydroxy; or C_{3-7}cycloalkyl; and R^2 is as defined above; and

m is 1 or 2;

m' is 1 or 2;

m'' is 1 to 4; and

wherein all of the asymmetric carbon atoms have an S configuration, except for those in the A, B, D, F, and G substituents, which may have an S or R configuration; and a pharmaceutically acceptable salt thereof.

4,477,441

RENIN INHIBITORS CONTAINING A C-TERMINAL DISULFIDE CYCLE

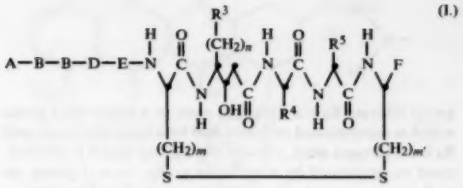
Joshua S. Boger, Bryn Mawr, and Daniel F. Veber, Ambler, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 14, 1983, Ser. No. 531,969

Int. Cl.[3] **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **8 Claims**

1. A peptide of the formula:



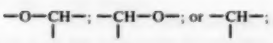
(I.)

wherein:

A is hydrogen; or

where

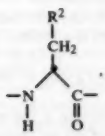
X is —O—;



and R_a^1 and R_b^1 may be the same or different and are hydrogen; $Y-(CH_2)_{p'}-$ or $Y-(CH_2)_{p''}-CH=CH-(CH_2)_{p''}$, where Y is hydrogen; C_{1-4}alkyl; aryl; C_{3-7}cycloalkyl; or C_{3-7}cycloalkyl or aryl substituted with up to five members independently selected from the group consisting of C_{1-3}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo;

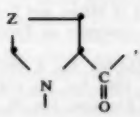
p is 0 to 5; and p′ and p″ are independently 0 to 2; except that where X is —O—, only one of R_a^1 or R_b^1 is present;

B is absent; glycyl; sarcosyl; or



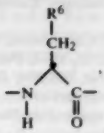
where R^2 is hydrogen; C_{1-4} alkyl; hydroxy C_{1-4} alkyl; aryl; aryl substituted with up to three members selected from the group consisting of C_{1-4}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo; indolyl; 4-imidazolyl; amino C_{2-4} alkyl; guanidyl C_{2-3} alkyl; or methylthiomethyl;

D is absent; or



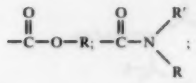
where Z is $-(CH_2)_q-$ and q is 1 or 2; or —S—;

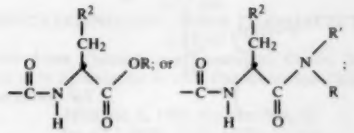
E is absent; or



where R^6 is hydrogen; C_{1-4}alkyl; aryl; aryl C_{1-4}alkyl; or aryl C_{1-4}alkyl or aryl where the aryl portion is substituted with up to three members selected from the group consisting of C_{1-4}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo; or indolyl;

F is hydrogen;





where R and R′ are independently hydrogen or C_{1-4}alkyl;

R^3 is C_{3-6} alkyl; C_{3-7} cycloalkyl; aryl; or C_{3-7}cycloalkyl or aryl substituted with up to three members selected from the group consisting of C_{1-4}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo;

R^4 is hydrogen; or

where R^7 is hydrogen; C_{1-4}alkyl; hydroxy; or C_{3-7}cycloalkyl; and R^6 is as defined above;

R^5 is hydrogen;

where R^6 and R^7 are as defined above; or $-(CH_2)_r-R^8$, where r is 0 or 1–4; and R^8 is heterocyclic; heterocyclic substituted with up to five members independently selected from the group consisting of C_{1-6}alkyl, hydroxy, trifluoromethyl, C_{1-4}alkoxy, halo, aryl, aryl C_{1-4}alkyl, amino, and mono- or di-C_{1-4}alkylamino; guanidyl C_{2-3}alkyl; or amino C_{1-4}alkyl;

m and m′ are independently 1 or 2;

n is 1 to 4; and

wherein all of the asymmetric carbon atoms have an S configuration, except for those in the A, B, D, and F substituents, and at the junction of F, which may have an S or R configuration; and a pharmaceutically acceptable salt thereof.

4,477,442
COMPOSITION OF MATTER AND PROCESS

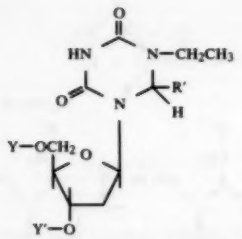
Harvey I. Skulnick, Oshtemo, and Harold E. Renis, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 66,251, Aug. 9, 1979, abandoned, which is a continuation of Ser. No. 968,876, Dec. 12, 1978, Pat. No. 4,239,753, which is a continuation of Ser. No. 802,504, Jun. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 715,663, Aug. 19, 1976, abandoned. This application Nov. 5, 1980, Ser. No. 206,311

Int. Cl.³ A61K *31/70, 31/71*

U.S. Cl. 424—180 **18 Claims**

1. A process for treating susceptible DNA viral infectious disease in a human and animal host without exhibiting anti-bacterial activity against *Escherichia coli* which comprises administering to the viral host an effective therapeutic amount for the treatment of susceptible DNA viral infections of a compound of the formula:



wherein R' is selected from the group consisting of hydrogen and lower alkyl of 1 through 4 carbon atoms; Y is selected from the group consisting of hydrogen, carboxacyl of from 1 through 18 carbon atoms, and phosphono; and Y'' is selected from the group consisting of carboxacyl of from 1 through 18 carbon atoms and hydrogen; and pharmaceutically acceptable salts thereof, in combination with a pharmaceutical carrier.

4,477,443
TYLOSIN DERIVATIVES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Hamao Umezawa; Sumio Umezawa, both of Tokyo; Tsutomu Tsuchiya, Kanagawa; Tomio Takeuchi, Tokyo; Akihiro Tanaka, Kanagawa; Hidenori Iwamoto, Saitama, and Shuichi Sakamoto, Tokyo, all of Japan, assignors to Zaidan Hojin Biselbutsu Kagaku Kenkyu Kai (Microbial Chemistry Research Foundation), Tokyo, Japan

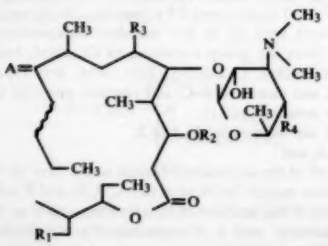
Filed Jul. 6, 1982, Ser. No. 395,463

Claims priority, application Japan, Jul. 9, 1981, 56-107485; Sep. 29, 1981, 56-154068; Nov. 30, 1981, 56-192627

Int. Cl.³ A61K *31/71;* **C07H** *17/08*

U.S. Cl. 424—180 **18 Claims**

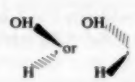
1. A tylosin compound represented by the formula



wherein R_1 is a hydroxyl group; a halogen atom; an

group wherein R_5 is a hydrogen atom or a lower alkyl group which is unsubstituted or substituted by a hydroxyl group, and R_6 is a hydrogen atom, a lower alkyl group which is unsubstituted or substituted by a hydroxyl group, an aryl group, an aralkyl group, a cycloalkyl group having 3–10 carbon atoms, a $—CO(O)_m—R_7$ group wherein m is 0 or 1, and R_7 is a lower alkyl group, an aryl group, an aralkyl group, a furanyl group, a pyridyl group, or $—CH_2—R_{13}$ group, wherein R_{13} is a mono-, di-, or trifluoromethyl group; an $—N(CH_3)_n$ group wherein n is an integer of 2–15 and which is unsubstituted or substituted by an oxo group, a hydroxyl group, a lower alkyl group, or a hydroxy lower alkyl group, an imidazolyl group, a morpholino group, or a piperazino group each of which is unsubstituted or substituted by a lower alkyl group, or a $—OOCCH_2—R_8$ group wherein R_8 is an

group wherein R_9 and R_{10}, which may be the same or different, each is a hydrogen atom or a lower alkyl group; said R_9 and R_{10} may be combined with each other to form an alkylene group having 3–7 carbon atoms or a $—S—R_{11}$ group wherein R_{11} is a furanyl group or a pyridyl group; R_2 is a hydrogen atom or a lower alkanoyl group; R_3 is a methyl group or a $—CH_2CHO$ group; R_4 is a hydrogen atom or a hydroxyl group; A is O=,



line ⁓ is a single bond or a double bond; and line ---- is a single bond, a double bond, or O; with the proviso that, when said R_1 is a hydroxyl group, said R_3 is a methyl group and R_4 is a hydrogen atom, or said line ---- is O; or when said R_1 is a halogen atom, said R_3 is a methyl group or said line ---- is O.

5. A pharmaceutical composition containing a therapeutically effective amount of a tylosin compound as claimed in claim 1, in combination with a pharmaceutically acceptable carrier.

4,477,444
ANTRACYCLINE GLYCOSIDES, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Antonino Suarato; Sergio Penco, both of Milan, and Federico Arcamone, Nerviano, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

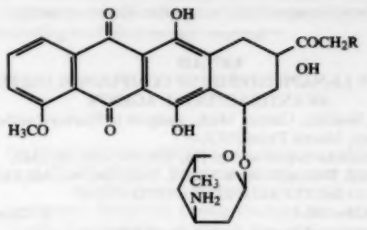
Continuation-in-part of Ser. No. 336,705, Jan. 4, 1982, abandoned. This application Oct. 15, 1982, Ser. No. 434,509

Claims priority, application United Kingdom, Jan. 21, 1981, 81 01792

Int. Cl.³ A61K *31/70;* **C07H** *15/24*

U.S. Cl. 424—180 **6 Claims**

1. An anthracycline glycoside of general formula A:



(A)

Wherein R is a hydrogen atom or a hydroxy group and its pharmaceutically acceptable salts.

5. A method of inhibiting the growth of a tumor selected from the group consisting of P388 ascitic leukemia and transplanted Gross leukemia, which comprises administering to a host afflicted with said tumor an amount of a compound according to claim 1 sufficient fo inhibit the growth of said tumor.

4,477,445

3-KETO-19-NOR-Δ4,9-STEROIDS

Daniel Philibert, La Varenne Saint-Hilaire; Jean G. Teutsch, Pantin; Germain Costerousse, Saint-Maurice, and Roger Deraedt, Pavillons-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

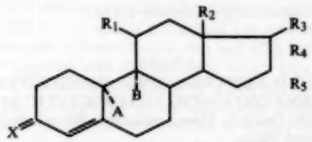
Filed Feb. 23, 1983, Ser. No. 469,042

Claims priority, application France, Mar. 1, 1982, 82 03338

Int. Cl.³ A61K *31/56*

U.S. Cl. 424—239 **31 Claims**

1. A compound selected from the group consisting of 3-keto-19-nor-$\Delta^{4,9}$-steroids of the formula



I

wherein R_1 is selected from the group consisting of naphthyl, phenylphenyl, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms optionally containing additional unsaturation, phenoxy, furyl, cycloalkyl of 3 to 6 carbon atoms, thienyl optionally substituted with at least one member of the group consisting of halogen and alkyl and haloalkyl of 1 to 6 carbon atoms and phenyl optionally substituted with at least one member of the group consisting of —OH, halogen, —CF_3, alkyl and alkoxy of 1 to 6 carbon atoms, alkenyloxy of 2 to 6 carbon atoms, phenoxy and alkylthio of 1 to 6 carbon atoms optionally oxidized to the sulfoxide or sulfone, R_2 is selected from the group consisting of methyl and ethyl, R_3 is selected from the group consisting of hydrogen, optionally substituted alkyl of 1 to 6 carbon atoms, optionally substituted alkenyl and alkynyl of 2 to 6 carbon atoms wherein the optional substituents are at least one member of the group consisting of alkylamino or dialkylamino or a halogen, alkylthio, alkoxy and trimethylsilyl, —OH, acetyl, hydroxyacetyl, carboxyalkoxy of 2 to 4 carbon atoms optionally esterified or salified and hydroxyalkyl of 1 to 6 carbon atoms optionally esterified, R_4 is selected from the group consisting of hydrogen, alkylthio and alkoxy of 1 to 12 carbon atoms, trialkylsilyl of 1 to 6 carbon atoms, —CN, —OH and alkyl, alkenyl and alkynyl of up to 12 carbon atoms optionally substituted with at least one member of the group consisting of halogen and alkylamino and dialkylamino of 1 to 6 alkyl carbon atoms, R_5 is selected from the group consisting of hydrogen and methyl is the α- or β-position, X is =0 or hydroxyimino or alkoxyimino of 1 to 4 carbon atoms in the syn or anti form and A and B are an epoxy or a second bond in the 9(10) position and their non-toxic, pharmaceutically acceptable acid addition salts when R_4 is an amino group, with the proviso that A and B are not a second bond in the 9(10)-position when X is =0 and R_5 is hydrogen and (a) R_2 is methyl and (α) R_3 is —OH and (i) R_1 is ethyl or phenyl and R_4 is hydrogen or (ii) R_1 is ethyl, propyl, isopropyl, vinyl, allyl, isopropenyl, phenyl, 4-fluorophenyl, methoxyphenyl or thienyl and R_4 is ethynyl or (iii) R_1 is propyl, isopropyl, vinyl, allyl, isopropenyl, 4-methoxyphenyl or thienyl and R_4 is methyl and (β) R_3 is acetyl and (i) R_1 is ethyl, vinyl or phenyl and R_4 is —OH or (ii) R_1 is vinyl and R_4 is methyl and (b) R_2 is ethyl and R_1 is vinyl, R_3 is —OH and R_4 is hydrogen.

11. An antiglucocorticoid composition comprising an antiglucocorticoidally effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

4,477,446

1-BENZAZEPINES AND THEIR PHARMACEUTICAL USES

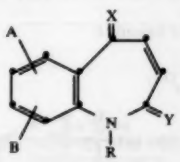
Howard Jones, Ossining, and Stephen M. Coutts, Scarsdale, both of N.Y., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Jul. 1, 1983, Ser. No. 509,616

Int. Cl.³ A61K *31/55*; C07D *223/16*

U.S. Cl. 424—244 **15 Claims**

1. A compound of the formula



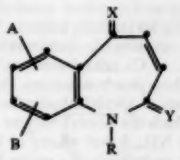
and pharmaceutically acceptable salts thereof wherein:

X and Y are independently S, NR, or CH-R;

A and B are independently halo, OH, OR, CF_3 or R; and

R is lower alkyl having 2 to 4 carbon atoms, aryl having 6 to 14 carbon atoms, aralkyl or aminoalkyl wherein the alkyl groups contain 1 to 4 carbon atoms.

4. An antiallergic composition comprising as the active ingredient a member of the formula.



and pharmaceutically acceptable salts thereof, wherein:

X and Y are independently S, NR or CH-R;

A and B are independently halo, OH, OR, CF_3 or R; and

R is lower alkyl having 2 to 4 carbon atoms, aryl having 6 to 14 carbon atoms, aralkyl or aminoalkyl wherein the alkyl groups contain 1 to 4 carbon atoms in a pharmaceutically acceptable carrier.

4,477,447
7-ACYLAMINOCEPHALOSPORANIC ACID DERIVATIVES

Ikuo Ueda, Toyonaka; Tsutomu Teraji, Osaka; Takao Takaya, Kawanishi; Keiji Takai, Nara; Hisashi Takasugi, Osaka; Fumio Shimojo, and Shigetaka Nishino, both of Kawanishi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 337,499, Jan. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 329,861, Dec. 11, 1981, abandoned. This application Feb. 24, 1982, Ser. No. 351,858

Claims priority, application United Kingdom, Dec. 15, 1980, 8040108; Japan, Dec. 23, 1980, 55-183299; United Kingdom, Dec. 30, 1980, 8041516; Mar. 16, 1981, 8108135

Int. Cl.³ A61K *31/545;* **C07D** *501/22*

U.S. Cl. 424—246 **3 Claims**

1. Tert-butoxycarbonylmethyl 7-[2-(2-aminothiazol-4-yl)-2-methoxyiminoacetamido]-3-cephem-4-carboxylate (syn isomer).

2. An antimicrobial pharmaceutical composition comprising, as an active ingredient, an effective amount of the compound claimed in claim 1 in admixture with pharmaceutically acceptable carriers.

4,477,448
CEPHALOSPORIN DERIVATIVES AND USE AS ANTIMICROBIAL AGENTS

Helmut Hamberger, and Hans Flirl, both of Wien, Austria, assignors to Sandoz Ltd., Basel, Switzerland

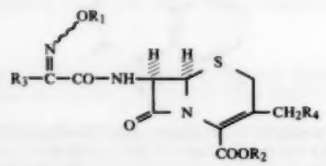
Continuation of Ser. No. 205,198, Nov. 10, 1980, abandoned, which is a continuation-in-part of Ser. No. 121,953, Feb. 15, 1980, abandoned. This application Jun. 21, 1982, Ser. No. 390,323

Claims priority, application Switzerland, Feb. 16, 1979, 1545/79; Jan. 10, 1980, 174/80

Int. Cl.³ A61K *31/545;* **C07D** *501/56*

U.S. Cl. 424—246 **15 Claims**

1. Compounds of formula I,



in which

R_1 is hydrogen, alkyl, phenylalkyl, carbalkoxyalkyl, C_{2-5}alkanoyl, alkoxy-carbonyl, carboxyalkyl, alkoxyalkyl, hydroxyalkyl, cyanoalkyl, or carbamoylalkyl,

R_2 is hydrogen, pivaloyloxymethyl or the residue of an easily splittable ester grouping,

R_3 is a 3- or 5-pyrazolyl radical, unsubstituted or mono- or di-substituted by alkyl, phenyl, alkoxy, alkylthio, carboxy, carboxyalkyl, carbamoyl, carbamoylalkyl, alkylsulphonyl, azido, C_{2-5}alkanoylamino, C_{1-4}alkoxycarbonylamino, benzylcarbonylamino, hydrazino, C_{2-5}alkanoylhydrazino, alkylidenhydrazino, phenyldenhydrazino, in which the phenyl nucleus is unsubstituted or substituted by NH_2, lower alkoxy or lower alkyl, furylidenhydrazino, carbalkoxy or a group R_5R_6N—, in which R_5 and R_6 are the same or different and are hydrogen or alkyl, provided that the nitrogen atoms and the 4-position of the pyrazole nucleus are either unsubstituted or substituted by alkyl, phenyl, or carbalkoxy,

and R_4 is hydrogen, acetoxy, carbamoyloxy or —S—Rh, in which Rh is a heterocyclic radical,

and pharmaceutically acceptable salts thereof.

8. A chemotherapeutic composition comprising an anti-bacterial effective amount of a compound of claim 1, in association with a chemotherapeutically acceptable diluent or carrier.

4,477,449
CERTAIN 1,8-NAPHTHYRIDINE COMPOUNDS USEFUL AS ANTIBACTERIAL AGENTS

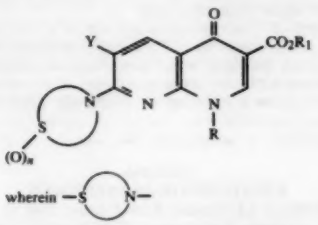
Joseph P. Sanchez, Canton, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 369,689, Apr. 19, 1982, abandoned. This application Mar. 1, 1983, Ser. No. 468,836

Int. Cl.³ A61K *31/435;* **C07D** *471/04*

U.S. Cl. 424—246 **9 Claims**

1. A compound having the structural formula:



wherein

is thiazolidine or thiomorpholine; R is alkyl having from one to four carbon atoms, vinyl or haloalkyl having from two to four carbon atoms; Y is hydrogen or fluorine; n is 0, 1, or 2; R_1 is hydrogen, alkyl from one to six carbon atoms or a cation derived from a pharmaceutically acceptable metal or amine, and the pharmaceutically acceptable salts thereof.

8. A pharmaceutical composition comprising an antibacterially effective amount of a compound as defined in claim 1 and the pharmaceutically acceptable salts thereof in combination with a pharmaceutically acceptable carrier.

4,477,450
TRIAZOLO [4,3-C]PYRIMIDINES SUBSTITUTED BY NITROGEN-CONTAINING HETEROCYCLIC RINGS

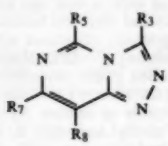
James J. Wade, Oakdale, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed Mar. 3, 1983, Ser. No. 471,837

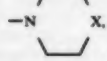
Int. Cl.³ A61K *31/535, 31/54;* **C07D** *487/04*

U.S. Cl. 424—246 **7 Claims**

1. A compound of the formula:



wherein R_3 is hydrogen or lower alkyl; one of R_5 and R_7 is the heterocyclic substituent



wherein X is oxygen, sulfur, sulfinyl, sulfonyl, methylene, imido or N-lower alkylimido; when R_5 is said heterocyclic substituent, R_7 is hydrogen or lower alkyl; when R_7 is said heterocyclic substituent, R_5 is hydrogen, lower alkylthio, phenyl or lower alkyl; and R_8 is hydrogen, phenyl or lower alkyl; or a pharmaceutically acceptable salt thereof.

6. A method for obtaining bronchodilation in a mammal, comprising administering an effective amount of a compound according to claim 1 to said mammal.

4,477,451

5,6-DIHYDRO-11-METHYLENEMORPHANTHRIDIN-6-ONES, THEIR PREPARATION AND DRUGS CONTAINING THESE COMPOUNDS

Gerd Steiner, Kirchheim; Ludwig Friedrich, Bruehl, and Dieter Lenke, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

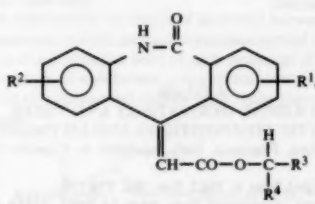
Filed Apr. 5, 1983, Ser. No. 482,004

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1982, 3212794

Int. Cl.³ C07D *403/06;* A61K *31/55*

U.S. Cl. 424—248.54 18 Claims

1. A 5,6-dihydro-11-methylenemorphanthridin-6-one compound of the formula I



I

where R^1 and R^2 are each hydrogen, halogen, alkyl of 1 to 3 carbon atoms or trifluoromethyl, R^3 is aminoalkyl, where alkyl is of 1 to 3 carbon atoms, and the amine nitrogen atom can be substituted by 1 or 2 alkyl radicals of 1 to 3 carbon atoms and can form part of a morpholine ring and R^4 is hydrogen, or R^3 and R^4 together with the carbon to which they are attached form a 6-membered saturated ring which can be converted to a bicyclic structure by an intramolecular methylene or bismethylene bridge and can contain a further nitrogen atom which can be substituted by alkyl of 1 to 3 carbon atoms, and its physiologically tolerated addition salts with acids.

15. A therapeutic agent for treating disorders associated with pathologically increased gastric secretion comprising a pharmaceutical carrier and an effective amount of a compound as defined in claim 1 as the active ingredient.

4,477,452

COMPOSITION OF MATTER COMPRISING A LYOPHILIZED PREPARATION OF A PENICILLIN DERIVATIVE

Bruce E. Haeger, Highland Mills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 247,586, Mar. 26, 1981, abandoned. This application May 17, 1982, Ser. No. 379,378

Int. Cl.³ A61K *31/495;* A23C *1/06*

U.S. Cl. 424—250 2 Claims

1. In a process for freeze-drying an aqueous solution of 6-[2-(4-ethyl-2,3-dioxo-1-piperazine(carboxamido)-2-phenylacetamido]-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid, sodium salt, also known as sodium piperacillin, by evaporating a frozen aqueous solution of sodium piperacillin under vacuum from the frozen state to dryness, the improvement which comprises employing an aqueous solution of sodium piperacillin at a concentration of from about 100 mg/ml to about 135 mg/ml.

4,477,453

OXIME ETHERS OF 1-PYRIDYL-3-PENTANONE

Jacques N. Astoin, Paris; Francis Lepage, Creteil, and Jean-Pierre M. J. Fromantin, Versailles, all of France, assignors to Univablot, Paris, France

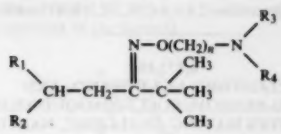
Filed Sep. 24, 1982, Ser. No. 423,104

Claims priority, application France, Dec. 11, 1981, 81 23147

Int. Cl.³ A61K *31/50;* C07D *401/12*

U.S. Cl. 424—250 9 Claims

1. An oxime ether of the formula I



(I)

in which

R_1 is chosen from a cyclohexyl radical, or a phenyl or benzyl radical optionally substituted by a halogen atom or by a straight chain or branched alkyl radical having 1 to 4 carbon atoms,

R_2 is a pyridyl radical,

each of R_3 and R_4, which may be the same or different, represents a straight chain or branched alkyl radical having 1 to 4 carbon atoms, or

R_3 and R_4 taken togehter represent a pyrrolidino moiety, a morpholino moiety or a piperazino moiety and

n is an integer of 1 to 4,

or a salt, quaternary ammonium derivative, or possible stereo-isomer or a mixture thereof of such an oxime ether.

4,477,454

2-ARYLTETRAAZAINDENES FOR TREATING CARDIAC INSUFFICIENCY

Rochus Jonas, Darmstadt; Michael Kloft; Hanns Wurziger, both of Darmstadt-Arheilgen; Juergen Harting; Hans J. Enenkel, both of Darmstadt; Klaus-Otto Minck, Ober-Ramstadt, and Hans-Jochen Schliep, Traisa, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

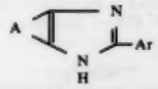
Filed May 9, 1983, Ser. No. 492,909

Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3217583

Int. Cl.³ A61K *31/495;* C07D *487/00*

U.S. Cl. 424—250 7 Claims

1. A method of treating cardiac insufficiency, comprising administering a positive inotropic effective amount of a 2-aryltetraazaindene of the formula



wherein —A— is —N=CH—CH=N— or —CH=N—N=CH—, Ar is unsubstituted phenyl or phenyl mono-, di- or tri-substituted by hydroxyl, mercapto, dialkylamino, trifluoromethyl and/or —Z—R groups, Z is —O—, —S— or —SO— and R is alkyl, alkenyl and alkynyl groups each having up to 5 C atoms, or a physiologically acceptable salt thereof.

4,477,455

KALIURETIC COMPOSITIONS CONTAINING TMPPT

Joseph Weinstock, Phoenixville, and Virgil D. Wiebelhaus, Springfield, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Feb. 4, 1983, Ser. No. 464,076
Int. Cl.³ A61K 31/505
U.S. Cl. 424—251 8 Claims

2. The method of producing kaliuresis in a patient in need thereof comprising administering orally or parenterally to said patient a nontoxic, kaliuretic quantity of 1,3,7,9-tetramethylpyrimido[5,4-g]pteridine-2,4,6,8-(1H,3H,7H,9H)-tetraone.

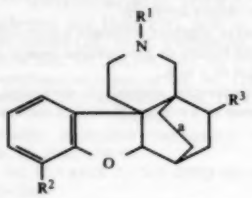
4,477,456

OCTAHYDRO-4A,7-ETHANO- AND -ETHENO-BENZOFURO[3,2-e]ISOQUINOLINE DERIVATIVES HAVING ANALGESIC, NARCOTIC ANTAGONIST AND ANOREXIGENIC PROPERTIES

Engelbert Ciganek, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

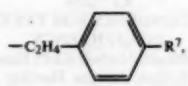
Continuation-in-part of Ser. No. 280,130, Jul. 2, 1981, abandoned. This application Apr. 22, 1982, Ser. No. 370,137
Int. Cl.³ A61K 31/47; C07D 491/08
U.S. Cl. 424—258 11 Claims

1. Compound of the formula:



wherein,

R^1 is selected from the group consisting of —H, C_{1-10} alkyl, $—CH_2R^6$,



and $—CH_2)_nCN$ in which n=1-3;

R_2 is selected from the group consisting of —H, —OH, C_{1-2} alkoxy and C_{2-12} acyloxy of an alkanoic acid;

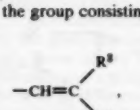
R^3 is selected from the group consisting of —H, C_{1-8} alkyl, and $—C(OH)(R^4)R^5$;

a is a single or double bond;

R^4 is selected from the group consisting of —H, and C_{1-8} alkyl;

R^5 is selected from the group consisting of —H, C_{1-8} alkyl, C_{1-8} alkenyl, C_{1-8} cycloalkyl, and $—CH_2)_mC_6H_5$ in which m=0-4 inclusive;

R^6 is selected from the group consisting of



—C=CH, C_{3-6} cycloalkyl, phenyl, 2-thienyl, 2-furyl, 2-tetrahydrofuryl, methyl substituted 2-furyl and methyl substituted 2-tetrahydrofuryl;

R^7 is selected from the group consisting of —H, C_{1-3} alkyl, $—OCH_3$, —Cl, —Br and —F; and each of R^8 and R^9 is independently selected from the group consisting of —H, $—CH_3$ and —Cl.

8. Method for the treatment of pain and/or for alleviating the effect of a narcotic drug and/or for exerting an anorexigenic effect in a mammal comprising administering internally to the mammal an effective analgesic or antagonist or anorexigenic amount of a compound of either of claims 1 or 4.

4,477,457

METHOD FOR INDUCING ANOREXIA USING NALMETRENE

Dewey H. Smith, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 28, 1982, Ser. No. 437,324
Int. Cl.³ A61K 31/485
U.S. Cl. 424—260 4 Claims

1. A method for exerting an anorexigenic effect in a mammal which comprises orally administering to said mammal an effective anorexigenic amount of nalmetrene or a pharmaceutically suitable salt thereof.

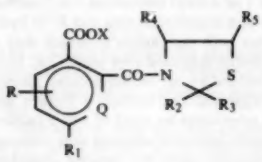
4,477,458

THIAZOLIDINE DERIVATIVES AND THEIR MUCOLYTIC COMPOSITIONS AND METHODS

Camillo C. Mora, Piacenza, Italy, assignor to Camillo Corvi S.p.A., Italy

Filed May 4, 1982, Ser. No. 374,776
Claims priority, application Italy, May 12, 1981, 21654 A/81
Int. Cl.³ A61K 31/425; C07D 277/04
U.S. Cl. 424—266 10 Claims

1. A compound of the formula



wherein Q is —CH= or N=, R and R_1 are hydrogen, R_2 and R_3, which can differ from each other, each represents a hydrogen atom, (C_1–C_4)-alkyl group, straight or branched, (C_2–C_4)-alkenyl, a phenyl or a 2,2,3-trimethyl-cyclopenten-3-ylmethyl group, a thienyl, furyl, pyrrolidyl, imidazolyl, pyridyl, oxazolyl, thiazolyl or pyrimidinyl moiety, and R_4 and R_5 are hydrogen and X represents a pharmacologically acceptable cation deriving from an inorganic base or a basic amino acid.

9. A mucolytic pharmaceutical composition characterized in that it comprises, as an active ingredient, a pharmaceutically effective amount of any one of the compounds of claims 2-7, in combination with at least a pharmaceutical vehicle.

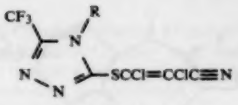
4,477,459

FUNGICIDAL 4-SUBSTITUTED-5-TRIFLUOROMETHYL-3-(1,2-DICHLORO-2-CYANOVINYL THIO)-1,2,4-TRIAZOLES

Edward I. Aoyagi, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 29, 1983, Ser. No. 518,340
Int. Cl.³ A01N 43/64; C07D 249/12
U.S. Cl. 424—269 12 Claims

1. A compound of the formula:



wherein R is lower alkyl or lower alkenyl.

5. A method for controlling fungi which comprises contacting said fungi or their growth environment with a fungicidally effective amount of the compound of the formula defined in claim 1.

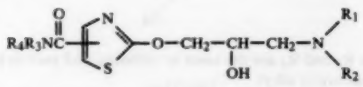
4,477,460

TOPICAL TREATMENT OF OCULAR HYPERTENSION

L. David Waterbury, San Mateo, and A. Peter Roszkowski, Saratoga, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 19, 1982, Ser. No. 435,195
Int. Cl.³ A61K *31/425*
U.S. Cl. 424—270 11 Claims

1. A method for treatment of increased intraocular pressure in a mammal, which method comprises topical applicaiton to the eye of a mammal in need of such treatment of an acceptable pharmaceutical ophthalmic composition containing 0.001–1% wt./vol of a compound chosen from those represented by the formula:



and their pharmaceutically acceptable, non-toxic salts wherein

R_1 and R_2 are each independently selected from the group of hydrogen, lower alkyl, lower cycloalkyl, lower alkenyl, phenyl optionally substituted, and lower phenylalkyl;

R_3 and R_4 are each independently selected from the group of hydrogen, linear or branched alkyl, cycloalkyl, and phenyl; and

wherein $R_4R_3NC(O)$ is a substituent on the thiazole ring at either the 4or - 5- position.

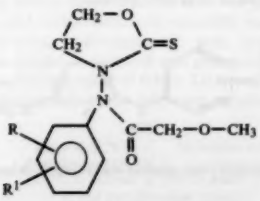
4,477,461

N-ARYL-N-ACYL-3-AMINO-1,3-OXAZOLIDINE-2-THIONES HAVING FUNGICIDAL ACTIVITY

Luigi Garlaschelli, Pavia; Franco Gozzo, S. Donato Milanese; Vincenzo Mendillo, Paullo; Carlo Garavaglia, Cuggiono; Luigi Mirenna, Milan, and Angela Zagni, Peschiera Borromeo, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Sep. 29, 1982, Ser. No. 426,893
Claims priority, application Italy, Oct. 1, 1981, 24245 A/81
Int. Cl.³ C07D *263/26;* A01N *43/76*
U.S. Cl. 424—272 7 Claims

1. A compound of formula:



(I)

wherein

R and R^1, equal to or different from each other, represent an alkyl C_1–C_4, a halogen atom, an alkoxyl C_1–C_4.

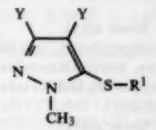
4,477,462

FUNGICIDAL 1-METHYL-3,4-DIHALO-5-ALKYLTHIOPYRAZOLES

Edward I. Aoyagi, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 31, 1983, Ser. No. 499,564
Int. Cl.³ C07D *231/18;* A01N *43/56*
U.S. Cl. 424—273 P 12 Claims

1. A compound of the formula



wherein R^1 is alkyl having 3 to 6 carbon atoms or benzyl where the phenyl ring is optionally substituted with 1 to 2 substituents each independently selected from halogen, cyano, nitro, trihalomethyl and lower alkyl; and Y is chloro or bromo.

7. A method for controlling fungi which comprises contacting said fungi or their growth environment with a fungicidally effective amount of a compound of the formula defined in claim 1.

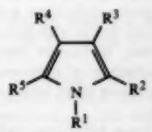
4,477,463

ANTIINFLAMMATORY AND/OR ANALGESIC 1-ALKYL-4,5-DIARYL-2-FLUOROALKYL-1H-PYRROLES

Saul C. Cherkofsky, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 10, 1982, Ser. No. 376,650
Int. Cl.³ C07D *207/32;* C01D *403/04;* A61K *31/44, 31/40*
U.S. Cl. 424—274 10 Claims

1. A compound having the formula:



(I)

wherein

R^1 is methyl or ethyl;

R^2 is CF_3 or CF_2CF_3;

R^3 is H, methyl, or ethyl; and

R^4 and R^5 independently are pyridyl or 4—XC_6H_4— where X is H, F, Cl, Br, R^6, $R^6S(O)_n$, R^6O, or R^6R^7N where R^6 and R^7 independently are methyl or ethyl and n=0 or 2; provided that:

(1) R^4 and R^5 cannot both be 4—FC_6H_4—;

(2) R^4 and R^5 cannot both be C_6H_5—; and

(3) R^4 cannot be 4—FC_6H_4— when R^5 is 4—$CH_3OC_6H_4$;

or a pharmaceutically suitable salt of a compound of Formula (I) when R^4 or R^5 is pyridyl or 4—$R^6R^7NC_6H_4$—.

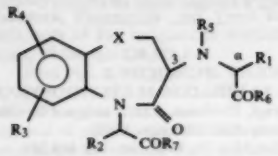
4,477,464

HETERO-BENZAZEPINE DERIVATIVES AND THEIR PHARMACEUTICAL USE

Joel Slade, Carmel, and James L. Stanton, Ossining, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 10, 1983, Ser. No. 465,694
Int. Cl.³ A61K *31/55;* C07D *513/04*
U.S. Cl. 424—275 18 Claims

1. A compound of the formula



(I)

wherein

R_1 is hydrogen, lower alkyl, amino-lower alkyl, acylamino-lower alkyl, aryl, aryl-lower alkyl, cycloalkyl or cycloalkyl-lower alkyl;

R_2 is hydrogen or lower alkyl;

R_3 and R_4, each independently, represent hydrogen, lower alkyl, lowr alkoxy, lower alkanoyloxy, hydroxy, halogen or trifluoromethyl; or R_3 and R_4 taken together represent lower alkylenedioxy;

R_5 is hydrogen or lower alkyl;

R_6 and R_7 represent independently hydroxy; lower alkoxy; (amino, mono- or di-lower alkylamino)-substituted lower alkoxy; carboxy-substituted lower alkoxy; lower alkoxycarbonyl-substituted lower alkoxy; aryl-substituted lower alkoxy; (hydroxy, lower alkanoyloxy or lower alkoxy)-substituted lower alkoxy; (hydroxy, lower alkanoyloxy or lower alkoxy)-substituted lower alkoxymethoxy; bicyclo[2,2,1]-heptyloxycarbonyl-substituted lower alkoxy; 3-phthalidoxy; (lower alkyl, lower alkoxy, halo)-substituted 3-phthalidoxy; amino; lower alkylamino; di-lower alkylamino; pyrrolidino, piperidino or perhydroazepino; (amino or acylamino)-substituted lower alkylamino; α-(carboxy or lower alkoxycarbonyl)-substituted lower alkylamino; aryl-substituted lower alkylamino which can be substituted on the α-carbon by carboxy or lower alkoxycarbonyl;

X represents $S(O)_p$, N—R_8 or O, in which radicals R_8 represents hydrogen, lower alkyl or aryl, and p represents zero, one or two; and

wherein the carbocylic ring may also be hexahydro; and

wherein within the above definitions acylamino represents lower alkanoylamino; lower alkoxycarbonylamino; aryl-lower alkanoylamino; aryl-lower alkoxycarbonylamino; or aroylamino in which aroyl represents benzoyl or benzoyl substituted by lower alkyl, lower alkoxy or halogen, or nicotinoyl; and

wherein within the above definitions aryl represents phenyl unsubstituted or mono- or di-substituted by lower alkyl, lower alkoxy, lower alkylenedioxy, lower alkanoyloxy, hydroxy, halogen or trifluoromethyl; and cycloalkyl contains 3 to 8 carbons; or a pharmaceutically acceptable salt thereof.

16. A pharmaceutical composition suitable for oral or parenteral administration to mammals for the treatment or prevention of diseases responsive to inhibition of angiotensin-converting enzyme comprising an effective amount of a compound of claim **1** in combination with one or more pharmaceutically acceptable carriers.

4,477,465

SUBSTITUTED 4,10-DIHYDRO-10-OXOTHIENO BENZOXEPINS

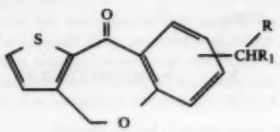
Lawrence L. Martin, Lebanon, and Linda L. Setescak, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Mar. 10, 1983, Ser. No. 474,218

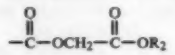
Int. Cl.³ A61K *31/38*; **C07D** *495/04*

U.S. Cl. 424—275 **20 Claims**

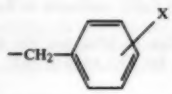
1. A 4,10-dihydro-10-oxothieno benzoxepin derivative having the formula



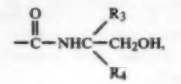
where R is hydrogen and lower alkyl; R_1 is



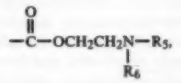
where R_2 is hydrogen, lower alkyl and benzyl of the formula



where X is hydrogen, lower alkyl, lower alkoxy, halogen, trifluoromethyl, nitro and amino;



where R_3 and R_4 are the same or different and each is hydrogen and lower alkyl;



where R_5 and R_6 are the same or different and each is hydrogen and lower alkyl; and the pharmaceutically acceptable addition salts thereof.

11. A method of alleviating pain in a mammal which comprising administering to a mammal an effective pain alleviating amount of the compound of claim **1**.

4,477,466

ACYLOXY DERIVATIVES OF [PHENYLSULFONYL(OR SULFINYL)]THIOPHENESULFONAMIDE FOR THE TOPICAL TREATMENT OF ELEVATED INTRAOCULAR PRESSURE

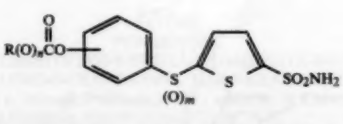
Kenneth L. Shepard, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 497,393, May 23, 1983, abandoned. This application Jun. 20, 1983, Ser. No. 505,618

Int. Cl.³ A61K *31/38, 31/40*; **C07D** *333/00*

U.S. Cl. 424—275 **13 Claims**

1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein

m is 1 or 2;

n is 0 or 1;

R is

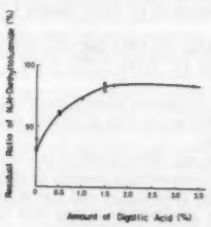
(1) C_{1-18}alkyl, either straight or branched chain,
(2) C_{1-18}haloalkyl, wherein halo is chloro, bromo, or fluoro,
(3) R^1R^2N-C_{1-5}alkyl, wherein R^1 and R^2 are independently hydrogen or C_{1-3}alkyl, or R^1 and R^2 are joined together to form a heterocycle selected from piperidinyl, morpholinyl, or pyrrolidinyl,
(4) C_{1-3}alkoxycarbonyl-C_{1-5}alkyl,
(5) C_{3-6}cycloalkyl,
(6) C_{3-6}cycloalkyl-C_{1-3}alkyl,
(7) C_{1-3}alkyl-C_{3-6}cycloalkyl,
(8) aryl, wherein aryl is a carbocycle or heterocycle selected from phenyl, naphthyl, pyridinyl, furanyl or thienyl, either unsubstituted or substituted with one or more of C_{1-3}alkyl, halo or C_{1-3}alkoxy,
(9) aryl-C_{1-3}alkyl, either unsubstituted or substituted with one or more of halo, C_{1-3}alkyl or C_{1-3}alkoxy,
(10) C_{2-6}alkenyl,
(11) C_{2-6}alkynyl,
(12) aryl-C_{2-6}alkenyl,
(13) NR^3-piperidinyl, wherein R^3 is C_{1-3}alkyl or C_{2-5}alkanoyl, or
(14) C_{1-3}alkoxy-C_{1-5}alkyl.

4,477,467

INSECT REPELLENT

Kazunori Nishizawa, Sakura, and Haruya Kato, Funabashi, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 906,590, May 16, 1978, abandoned.
This application Jan. 25, 1982, Ser. No. 342,404
Claims priority, application Japan, May 19, 1977, 52-57934
Int. Cl.[3] A01N *37/00, 37/12, 37/18*
U.S. Cl. 424—317 3 Claims



1. An insect repellent having increased resistance to absorption through the skin, consisting essentially of 1–50% by weight of N,N-diethyltoluamide as a repellent component, and an aromatic proton donor selected from the group consisting of phthalic acid, terephthalic acid, trimellitic acid, pyromellitic acid, gallic acid, hydroxytrimesic acid, and tannic acid; wherein the weight in grams of said proton donor relative to said N,N-diethyltoluamide is 0.5 to 2.0 times the value of Q which is calculated from the following equation:

$$Q = \frac{\text{amount of N,N—diethyltoluamide (g)} \times \text{molecular weight of proton donor}}{191.26 \times \text{number of proton donor groups in one proton donor molecule.}}$$

4,477,468

TREATMENT OF TYPE II HERPES VIRUS WITH FLURBIPROFEN

Jay W. Heckler, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 6, 1982, Ser. No. 447,037
The portion of the term of this patent subsequent to Sep. 25, 2001, has been disclaimed.
Int. Cl.[3] A61K *31/19, 31/235*
U.S. Cl. 424—317 2 Claims

1. A process for therapeutic treatment of Herpes Type II virus comprising the systemic or topical administration to a human or animal infected with Herpes Type II virus of an effective antiviral amount of 3-fluoro-4-phenylhydratropic acid or alkyl ester of from 1 to 8 carbon atoms, inclusive, including isomeric forms thereof, or a pharmacologically acceptable salt thereof.

4,477,469

PREPARATIONS CONTAINING METHYLSULFONYLMETHANE AND METHODS OF USE AND PURIFICATION

Robert J. Herschler, 3080 NW. 8th St., Camas, Wash. 98607

Division of Ser. No. 71,068, Aug. 30, 1979, Pat. No. 4,296,104.
This application Jun. 26, 1981, Ser. No. 277,592
Int. Cl.[3] A61K *31/17*
U.S. Cl. 424—322 25 Claims

1. A composition suitable for application to tissue and/or body fluids of a human or other animal subject comprising a pharmaceutically acceptable composition containing about one to twenty weight percent methylsulfonylmethane as an essential active agent, and an amount from about one to twenty weight percent carbamide effective to enhance the activity of the methylsulfonylmethane.

4,477,470

METHOD FOR PRODUCING DIURESIS USING M-AMINO-α-METHYLPHENETHYLAMINE

Francis T. Brennan, Springfield, Pa.; Genevieve F. Sosnowski, Wilmington, Del., and Joseph Weinstock, Phoenixville, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Oct. 20, 1983, Ser. No. 543,737
Int. Cl.[3] A61K *31/135*
U.S. Cl. 424—330 6 Claims

1. A method of producing water diuresis or saluresis in a human or animal patient in need thereof comprising administering orally or parenterally to said patient a nontoxic, diuretic quantity of m-amino-α-methylphenethylamine, an optical isomer thereof or a pharmaceutically acceptable, acid addition salt thereof.

4,477,471

PRESERVATION OF FOODS WITH NON-LACTOSE FERMENTING *STREPTOCOCCUS LACTIS* SUBSPECIES *DIACETILACTIS*

Carlos F. Gonzalez, Sarasota, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Filed Apr. 15, 1982, Ser. No. 368,724
Int. Cl.[3] A23C *9/12, 17/00*; A23B *4/12*; C12N *15/00, 1/00, 1/20*; C12R *1/46*
U.S. Cl. 426—43 10 Claims

1. In the method for the preservation of a food by providing a culture in the food containing lactose which generates a bacterial spoilage inhibitory substance the improvement which comprises: providing in the food a modified strain of *Streptococcus diacetilactis* which is unable to ferment lactose to lactic acid as a result of the removal of a naturally occurring 41 Mdal plasmid from a strain of *Streptococcus diacetilactis* containing the plasmid, wherein the modified strain produces the inhibitory substance which is equivalent in effectiveness in inhibiting *Pseudomonas fluorescens* to the strain with the 41 Mdal plasmid.

4,477,472

PROCESS FOR PREPARING POWDERED OIL AND FAT

Akiro Seto; Muneo Sakai, and Takashi Sakita, all of Kanagawa, Japan, assignors to Nissin Oil Mills, Ltd., Tokyo, Japan

Filed Jan. 11, 1982, Ser. No. 338,719
Claims priority, application Japan, Jan. 9, 1981, 56-1132
Int. Cl.³ A23L *1/20*
U.S. Cl. 426—98 4 Claims

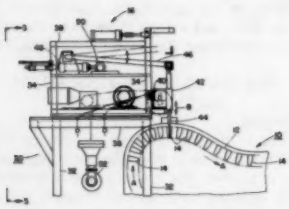
1. A process for preparing a powdered oil/fat which comprises partially hydrolyzing a soybean protein with an acid or a protease until the solubility of the protein in a 5% aqueous solution of trichloroacetic acid is in the range of about 15–50%, to obtain an aqueous solution of protein, adding an oil/fat to said solution to obtain an O/W emulsion and spray-drying said emulsion.

4,477,473

APPARATUS AND METHOD FOR PRODUCING FROZEN CONFECTIONS

C. Donald Schoonmaker, Boonton, and Jonas Bortkevicius, No. Brunswick, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 12, 1983, Ser. No. 457,326
Int. Cl.³ G01N *33/02;* A23P *1/00;* B67D *5/16*
U.S. Cl. 426—231 18 Claims



10. In a method for the production of frozen confections of the type in which sticks project from a block of frozen confection material, wherein a plurality of molds having open upper ends for receiving flowable confection material are conveyed along a predetermined path for the formation of said frozen confections; the improvement comprising feeding a constant metered volume of said confection material at a constant rate in a semi-frozen condition from a supply of said confection material; lowering said nozzle means into said molds; and conveying metered quantities of the material into dispensing nozzle means while raising said nozzle means from said molds as said confection material is dispensed from said nozzle means into said molds in synchronism with the metered feed rate of said material to thereby provide a continuous metered flow of said confection material into said molds during each rising motion of said nozzle means; whereby the formation of voids in said material during the filling of said molds is avoided, said confection material is conveyed through a positive displacement, pressure-responsive metering pump which advances a metered quantity of said confection material into said nozzle means during each rising cycle of said nozzle means.

4,477,474

PROCESS FOR SOLUBILIZING FD AND C RED #3 UNDER ACIDIC CONDITIONS AND COMPOSITION

Joseph J. Saladini, Dover, Del.; John V. Parnell, III, Larchmont, N.Y.; Wayne L. Steensen, Newark, and Harry H. Topalian, Dover, both of Del., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 828,570, Aug. 29, 1977, Pat. No. 4,165,390. This application Aug. 20, 1979, Ser. No. 67,741
The portion of the term of this patent subsequent to Aug. 21, 1996, has been disclaimed.
Int. Cl.³ A23L *1/27, 1/04*
U.S. Cl. 426—250 20 Claims

1. A particulate dry FD&C Red #3 composition which when solubilized in an aqueous solution in which the pH is adjusted to below about 4.5 results in a solution which is substantially cloud-free and precipitate-free comprising:

drying Red #3 on a substrate of gelatin effective to stabilize the Red #3 when in an aqueous solution and when the pH of the solution is adjusted to below about 4.5 providing a substantially cloud-free and precipitate-free solution, the gelatin being allowed to interact with the Red #3 to stabilize the Red #3 prior to adjusting the pH below 4.5.

4,477,475

METHOD FOR COLORING FISH FLESH

Steven J. Fishman, 25 Progress Pkwy., Maryland Heights, Mo. 63043

Filed Sep. 29, 1982, Ser. No. 426,626
Int. Cl.³ A22C *25/00;* A23L *1/27*
U.S. Cl. 426—250 16 Claims

1. A method for coloring fish flesh comprising the steps of:

introducing into said flesh an aqueous solution of a food dye by injecting said solution into the flesh via an array of a plurality of hypodermic needles; and

aging the fish flesh containing said injected dye for a period of at least about two days, thereby allowing the dye to diffuse through the flesh and produce a substantially even hue therethroughout.

4,477,476

METHOD FOR PROCESSING SALMON ROE PRODUCTS

Takahiko Kagawa, Tokyo, and Yasuhiko Sasamoto, Kanagawa, both of Japan, assignors to Taiyo Fishery Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 453,826
Int. Cl.³ A23L *1/272, 1/325*
U.S. Cl. 426—262 2 Claims

1. A method for processing salmon green egg, that is, previously untreated salmon roe into a salmon roe product, said method comprising:

salting said green egg under agitation in a saturated aqueous solution of salt containing a quantity of nitrite sufficient to impart a scarlet coloring to said roe product and being free from any precipitates; drying said salted egg; and immersing said dried, salted egg under agitation in a saturated aqueous solution of malate containing a quantity of nitrite sufficient to impart a scarlet coloring to said roe product and being free from any precipitates.

4,477,477

WINE PRESERVATION DEVICE AND METHOD

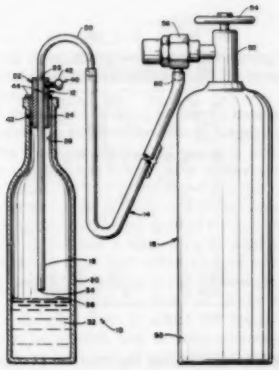
William L. Arter, 1214 Margarita, Fullerton, Calif. 92633

Filed Apr. 2, 1982, Ser. No. 364,779
Int. Cl.³ C12H *1/00;* B65B *55/00, 63/00*
U.S. Cl. 426—330.4 5 Claims

1. A wine preservation device for utilization in preserving the wine remaining in an open container having a pouring opening, comprising the combination of: means for defining a source of pressurized, inert gas; a valve connected to said source defining means; a connection to said valve; and an

adjustable nozzle connected to said source through said connection, said nozzle having mounting means thereon for supporting same on said container, when said device is used with said container, for locating and supporting said nozzle below the pouring opening in said container, said mounting means comprising a plurality of supports projecting in spaced relationship about the perimeter of said mounting means, said supports being engaged with the portion of said container adjacent said pouring opening when in use, thereby providing spaces between the perimeter surface of said mounting means and the interior surface of said pouring opening to permit air in said container between the surface of said remaining wine and said mounting means to be expelled through said spaces when said inert gas is introduced through said nozzle into the container.

5. A method of preserving the wine remaining in a previously opened container having a pouring opening, comprising



the steps of: inserting a nozzle through said pouring opening and locating the end of said nozzle in juxtaposition to the surface of said remaining wine; supporting said nozzle in place with a mount supported on said container adjacent said pouring opening, said mount comprising a plurality of supports projecting in spaced relationship about the perimeter of said mount, said supports being engaged with the portion of said container adjacent said pouring opening, thereby providing spaces between the perimeter surface of said mount and the interior surface of said pouring opening to permit air to pass therebetween; dispensing a pressurized inert gas through said nozzle into said container and simultaneously venting the displaced air in said container through said pouring opening; continuing the flow of said inert gas until it issues from said pouring opening; terminating the flow of said inert gas; removing said nozzle from said container; and closing said pouring opening with said inert gas deposited in said container.

4,477,478

ACID PRESERVATION SYSTEMS FOR FOOD PRODUCTS

Jeanne E. Tiberio, Lodi, and Michael C. Cirigliano, Tenafly, both of N.J., assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed Jun. 18, 1982, Ser. No. 389,978
Int. Cl.³ A23D *5/00*; A23L *1/24, 3/34*
U.S. Cl. 426—330.6 **17 Claims**

1. A salad dressing comprising between about 30 and about 60 percent by weight edible oil, between about 20 and about 50 percent by weight moisture, between about 0.89 and about 1.8 percent by weight acetic acid, based on total moisture content of the food composition, at least one salad dressing ingredient selected from the group consisting of egg yolk, buttermilk, buttermilk solids, dehydrated sour cream, nonfat dry milk solids, food particulates, salt, gums, emulsifiers, starch, spices and flavors, ethylenediaminetetraacetic acid, and a low level of chemical preservatives, and mixtures thereof and between about 0.1 and about 1.5 percent by weight fumaric acid, based on total moisture content of the food composition, the combined amounts of fumaric acid and acetic acid being effective to preserve the salad dressing against microbiological spoilage.

4,477,479

LIQUID DOUGH CONDITIONERS AND DOUGH PRODUCT CONTAINING SAME

Daniel A. Jervis, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,751
Int. Cl.³ A21D *2/14*; A23D *5/00*
U.S. Cl. 426—549 **6 Claims**

1. A dough conditioner which is liquid at room temperature comprising about 10 to about 90 weight % of diacetyl tartaric acid esters of glycerides, about 6 to about 86 weight % of glycerides, and about 4 to about 12 weight % of a compound selected from lactic acid and an acyl lactylic acid, wherein the acyl radical is a fatty acid having 14–22 carbon atoms.

4,477,480

METHOD OF PREPARING A CLEAN FLAVORED CEREAL STARCH

William C. Seidel, Monsey; George E. Orozovich, Flushing, and Darrell G. Medcalf, Chappaqua, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,755
Int. Cl.³ A23L *1/195, 1/187*
U.S. Cl. 426—578 **16 Claims**

1. A process for removing the off-taste in cereal starches comprising the steps of:

(a) dispersing and agitating a sufficient quantity of a cereal starch in water so as to form a homogenous starch slurry that is between about 18 and 45%, by weight, starch;

(b) adding an alkali to the slurry so that the slurry pH is no more than about 2 pH units from the starch's pasting pH;

(c) within about 5 hours of the alkali addition, removing the alkali liquid from the slurry;

(d) repeatedly washing the starch solids with an aqueous media, wherein the aqueous media does not substantially lower the starch pH below a pH of about 10; and

(e) drying the slurry.

4,477,481

METHOD FOR PRODUCING DRIED CITRUS PULP

William A. Eisenhardt, Jr., Worthington, Ohio; Fouad Z. Saleeb, Pleasantville, N.Y.; Randal P. McKay, Paramus, N.J., and Bary L. Zeller, Pleasantville, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jun. 24, 1982, Ser. No. 391,783
Int. Cl.³ A23L *2/00*; A23B *7/02*
U.S. Cl. 426—590 **8 Claims**

1. A method for preparing a dry citrus pulp material comprising the step of raising the pH of the wet pulp material to a pH of at least 4.0, said pH being increased by the addition of a water-soluble, edible, inorganic basic material and thereafter freeze drying the pH-adjusted pulp and comminuting the freeze dried pulp.

4,477,482

PEANUT FLAVORING COMPATIBLE WITH WATER BASED FOOD SYSTEMS

F. Lee Avera, Alameda, Calif., assignor to Jack W. Kuehn, Sr., Burnsville, Minn.

Division of Ser. No. 477,004, Mar. 21, 1983, abandoned. This application Jun. 7, 1983, Ser. No. 502,010

Int. Cl.³ A23L *1/36, 1/221*

U.S. Cl. 426—632 16 Claims

1. A hydrophilic peanut flavoring composition that is compatible with aqueous food systems which comprises about 40 to 50 wt-% ground peanuts with its peanut oil, about 20 to 25 wt-% of a polyhydroxy alcohol compound, about 14 to 20 wt-% of a sugar, and about 20–25 wt-% water, wherein the polyhydroxy alcohol compound and the sugar act to increase the hydrophilicity of the peanut oil.

4,477,483

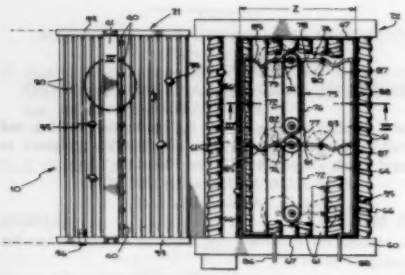
APPARATUS AND METHOD FOR CONTROLLING THE APPLICATION OF LIQUID SUBSTANCES TO SURFACES OF FRUIT

Philip J. Lewis, Corona, Calif., assignor to Brogdex Company, Pomona, Calif.

Filed Mar. 23, 1983, Ser. No. 478,469

Int. Cl.³ B05D *1/02*

U.S. Cl. 427—8 19 Claims



1. In an apparatus for applying a liquid substance to the surfaces of a plurality of discrete objects advanced in variable quantities along a path of roll means structured to agitate said objects to augment exposure of surfaces of said objects to be coated, applicator means for said liquid arranged to spray said liquid in atomized form in a treating zone generally transversely of the path of travel of the objects, the improvement comprising in combination:

means for determining the speed of advancement of the objects along said path;

means for determining the quantity of objects moving pass a selected place along said path; and

means for correlating the speed of advancement of said objects and variable quantities of said objects being advanced to regulate at the treating zone the amount of liquid discharged from said applicator means to provide optimum volume of liquid substance for application to the sensed quantity of objects.

9. A method of controlling the amount of liquid treating substance applied to a plurality of discrete fruit moving along a path at a selected rate of speed and in accordance with the variable quantity of fruit on said path, the application of liquid substance to the fruit being by more than one nozzle movable transversely over the path at a selected rate of speed in a spray zone, comprising the steps of:

sensing the speed of movement of the fruit along said path;

sensing the quantity of fruit on the path upstream from the application of the liquid substance at the spray zone;

and correlating the speed of movement of the fruit, sensed quantity of fruit, the transverse rate of movement of the nozzles, and the discharge pressure of the nozzles applying the liquid substance to control and to furnish an optimum effective volume of liquid substance at selected pressure for the varying quantity of fruit on the path at the spray zone.

4,477,484

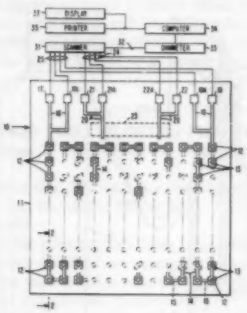
ELECTROLESS PLATING MONITOR

Frank Paoletti, Endwell, and Steven A. Schubert, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1982, Ser. No. 448,574

Int. Cl.³ B05D *1/00;* G01R *27/02*

U.S. Cl. 427—10 9 Claims



1. A process for monitoring the progress of electroless plating of sensitized elements comprising the steps of:

forming a coupon of insulative substrate having a plurality of holes with the hole walls interconnected in a series resistance circuit by conductors such that the hole walls are a part of said circuit;

sensitizing the walls of said holes with a solution to initiate the deposit of metal thereon;

immersing said sensitized coupon in an electroless metal plating bath to deposit metal on said walls; and

measuring the resistance of said circuit as an indication of the amount of metal plated onto said sensitized hole walls during said immersion.

4,477,485

PROCESS FOR FORMING AN ELECTRODE OF AN ORGANIC CELL

Hiromochi Muramatsu, Nagoya; Atsushi Watanabe, Toyokawa, and Kunihiko Hara, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 30, 1983, Ser. No. 509,797

Claims priority, application Japan, Jul. 12, 1982, 57-120770

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—38 9 Claims

1. A process for forming an electrode of an organic electroconductive material for use in an organic cell, in which a thin film of a metal is formed on the surface of at least a part of at least one side of the organic electroconductive material in a sheet form at such a temperature that no thermal deterioration occurs in said organic material, and then an atom-interdiffused layer is formed at the interface between said thin film and said electrode by a recoil ion implantation method.

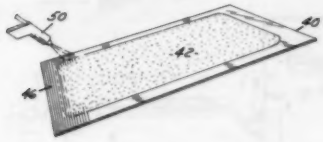
4,477,486
METHOD OF APPLYING AN OPAQUE SCREENING AREA

Premakaran T. Boaz, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 356,000, Mar. 8, 1982, abandoned. This application Feb. 16, 1984, Ser. No. 579,300

Int. Cl.³ B05D *3/02, 5/00*

U.S. Cl. 427—54.1 **3 Claims**



1. A method of applying an opaque screening area to a surface of a glass sheet characterized in that the method has the following steps:

applying to the surface of the glass sheet a masking material which defines the edges of the opaque screening area to be applied to the glass sheet, said masking material being nonreactive with the surface of the glass sheet and being heat decomposable into products which can be removed from the surface of the glass sheet without damage thereto, said masking material being applied to the surface of the glass sheet to provide a wide area of masking material extending away from said defined edges of the opaque screening area to be applied to the glass sheet;

applying a ceramic-containing material on the areas of the surface of the glass sheet to which the opaque screening areas are to be applied, said ceramic-containing material also coating at least part of said masking material generally along said portion of said masking material defining said edges of the opaque screening area, said ceramic material containing components which are heat fusable to the surface of the glass sheet to form the opaque screening area;

heating the glass sheet to (1) decompose said masking material so that it and any ceramic material overlying it can be removed from the surface of the glass sheet without any damage thereto, and (2) heat fuse said fusable components of said ceramic material to the surface of the glass sheet thereby to form the opaque screening area on the surface of the glass sheet; and

removing said decomposed masking material and any ceramic material overlying the same whereby the opaque screening material is defined by a sharp edge which had been defined by said masking material before removal thereof.

4,477,487
METHOD OF PRODUCING OXYGEN CONCENTRATION CELLS

Takao Kojima, Nagoya, and Naoto Naganuma, Seki, both of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 262,643, May 11, 1981, abandoned. This application Feb. 25, 1983, Ser. No. 469,828

Claims priority, application Japan, May 14, 1980, 55-63679

Int. Cl.³ G01N *27/58*

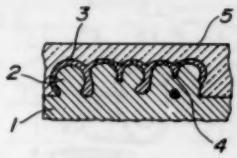
U.S. Cl. 427—123 **6 Claims**

1. A method for producing an oxygen concentration cell suitable for exposure to high temperature combustion gases which comprises the steps of: p1 (a) forming a green matrix by press molding a stabilized or partially stabilized zirconia raw material powder;

(b) producing electrode-adhering particles made of stabilized or partially stabilized zirconia granulated particles which have a substantially spherical shape and which contain no less than fifty percent by weight of granulated particles having a size of at least 44 microns and no less than ten percent by weight of fine particles having a size of no greater than ten microns to act as a sintering aid, said electrode-adhering particles being produced through granulation by spray drying fine primary particles;

(c) preparing fluidized electrode-adhering particles by adding an organic binder to said electrode-adhering particles;

(d) applying said fluidized electrode-adhering particles to a surface of said green matrix;



(e) sintering the green matrix and the applied electrode-adhering particles to form a monolithic matrix having a plurality of convex portions on the surface of the sintered matrix;

(f) applying an electrode to the surface of the sintered matrix; and

(g) applying a heat-resistant ceramic protective film to the electrode.

4,477,488
METHOD OF MANUFACTURING MAGNETIC RECORDING MEDIUM

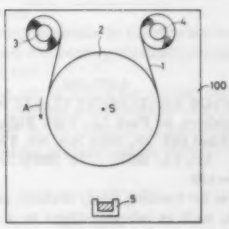
Ryuji Sugita, Hirakata; Kenji Kanai, Neyagawa; Seishi Sasaki, Nishinomiya, and Ken Takahashi, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 10, 1983, Ser. No. 473,766

Claims priority, application Japan, Mar. 16, 1982, 57-42043; Dec. 27, 1982, 57-231543

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—129 **4 Claims**



1. A method of manufacturing a magnetic recording medium including a high polymer substrate with a magnetic film deposited thereon, with or without intermediate layer(s) therebetween, the magnetic film containing Co-Cr as a host material, the constituent of Co being in a range of 70–90 weight %, comprising the steps of:

selecting the polymer substrate to have a linear expansion coefficient in the range of 1.0×10^{-5} to 2.9×10^{-5}/°C.;

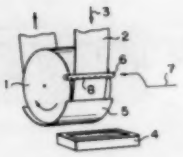
temperature controlling the outer surface of a cylindrical can to be within the range of 150°–300° C.; and

running the polymer substrate around the temperature controlled can and vapor depositing the magnetic film thereon during the running.

4,477,489
METHOD OF MAKING MAGNETIC RECORDING MEDIUM

Akio Yanai; Ryuji Shirahata, and Tatsuji Kitamoto, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 1, 1982, Ser. No. 413,890
Claims priority, application Japan, Sep. 3, 1981, 56-139095; Sep. 4, 1981, 56-139324
Int. Cl.³ H01F *10/02*
U.S. Cl. 427—132 3 Claims



1. A method of making a magnetic recording medium by causing a flow of vapor obtained by evaporating a magnetic metal deposition material to impinge and deposition on a moving substrate at an oblique angle with respect to the moving substrate, wherein the improvement comprises moving said substrate so that the incident angle (θ) vapor flow with respect to said substrate continuously changes from the maximum incident angle (θmax) to the minimum incident angle (θmin), and introducing an oxidizing gas in the vicinity of said substrate by use of a gas introducing means extending along the surface of said moving substrate in the direction perpendicular to the moving direction thereof and located at a position selected from near the maximum incident angle (θmax) portion of said vapor flow and near the minimum incident angle (θmin) portion of said vapor flow, during the formation of a thin ferromagnetic film on said substrate wherein said maximum incident angle (θmax) is in the range between 60° and 90°, and said minimum incident angle (θmin) is in the range between 30° and 75°.

4,477,490
ASBESTOS ABATEMENT COATING SYSTEM

Irving H. Weisberg, 44 Park La., Park Ridge, Ill. 60068

Filed Feb. 28, 1983, Ser. No. 470,156
Int. Cl.³ B05C *1/16*; B05D *5/10*
U.S. Cl. 427—136 10 Claims

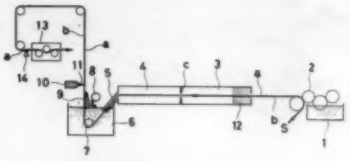
1. A process for bonding finely divided, particulate in-place contaminants, such as asbestos fibers to a soil surface layer upon which the contaminants have precipitated or with which the contaminants have become admixed, comprising the steps of: infusing the contaminated soil surface layer with an aqueous solution of a soluble silicate prepolymer and with an inorganic polyvalent cation catalyst for said silicate prepolymer; allowing said silicate prepolymer to cure and polymerize and to insolubilize in-situ in said contaminated soil layer to form a matrix in which silicate anions in said silicate prepolymer are chemically bonded with silicate moieties in both the contaminated soil layer and the asbestos fibers, said matrix encapsulating reactive entities in said soil layer which otherwise would interfere with a subsequently applied topcoat layer;

and applying an abrasion-resistant and impact-absorbent topcoat layer of resinous material to the surface of the infused and bonded soil layer.

4,477,491
ONE-SIDE ZINC HOT DIPPING PROCESS USING AN ANTI-PLATING AGENT

Kuniaki Sato; Hisao Yasunaga; Takahisa Yoshihara; Yoshinori Fujita, and Kazuaki Kyono, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Sep. 23, 1982, Ser. No. 422,475
Claims priority, application Japan, Nov. 18, 1981, 56-184702
Int. Cl.³ B05D *3/02, 3/12*
U.S. Cl. 427—211 5 Claims



1. A process for producing a one-side zinc hot dipped steel sheet, comprising the steps of

coating one surface of a steel sheet with an aqueous slurry of an anti-plating agent, said anti-plating agent containing 9 parts by weight of TiO_2, 9 parts by weight of Al_2O_3, 23 parts by weight of an alkali metal silicate, 11 parts by weight of NaOH, 17 parts by weight of boric acid and 32 parts by weight of MgO,

heating the coated sheet for drying and baking to form an anti-plating film on one surface of the steel sheet,

immersing the steel sheet with the anti-plating film in a molten zinc bath to plate the other surface of the steel sheet with zinc,

rendering the anti-plating film wet, and

subjecting the steel sheet to bending, thereby peeling off and removing the anti-plating film from the steel sheet, characterized in that

the coating and baking of the anti-plating agent are carried out under conditions meeting the following inequalities:

$X \geqq 750$,

$Y \geqq 2.27X - 2051.1$, and

$20 \leqq Y \leqq 60$

wherein X is the baking temperature in °C. and Y is the thickness of the dry anti-plating film in microns, in order to prevent entrainment of zinc on the anti-plating film and to ensure complete removal of the anti-plating film.

4,477,492
PROCESS FOR PREPARING SUPERFICIALLY POROUS SUPPORTS FOR CHROMATOGRAPHY AND CATALYSTS

Horacio E. Bergna, and Joseph J. Kirkland, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 22, 1983, Ser. No. 487,894
Int. Cl.³ B05D *7/00*; C02F *1/68*
U.S. Cl. 427—215 13 Claims

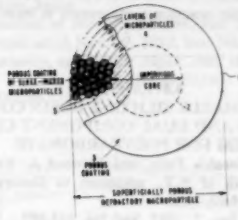
1. A process for preparing superficially porous macroparticles comprising

(a) forming a well mixed slurry of core macroparticles, colloidal inorganic microparticles to coat the macroparticles, and a liquid, said core macroparticles being (1) impervious and stable, (2) regularly shaped and (3) about 5–200 μm in size and said microparticles being substantially uniform in size and shape and having a size of about 4–1000 nm; the ratio of the weight of the microparticles to weight of liquid being from about 0.05 to about 0.5 and the ratio of volume of coating microparticles to total volume of coating microparticles and core macroparticles being from about 0.003 to about 0.7;

(b) atomizing the slurry to form a fine spray using spraying

conditions suitable to produce droplets of a size greater than the size of the core macroparticles;

(c) contacting the spray with a drying medium at a temperature of from about 130° C. to about 400° C. to evaporate the liquid or cooling the spray below the freezing point of



the liquid and drying the resulting frozen particles without thawing them; and

(d) heating the resulting dried coated macroparticles at a temperature and for a time sufficient to cause sintering resulting in about 5% to about 30% decrease in surface area of said dried, coated macroparticles.

4,477,493

PRODUCTION OF REACTION-BONDED SILICON CARBIDE BODIES

Kenneth Parkinson, Wirral, and Peter Kennedy, Broughton, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 19, 1983, Ser. No. 486,444

Claims priority, application United Kingdom, Apr. 30, 1982, 8212640

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—228 **3 Claims**

1. In the production of a silicon carbide artefact by siliconising a green body formed from a coherent mixture of carbon and silicon carbide powders the improvement comprising coating the surface of the green body with a paste comprising finely divided silicon powder and carbon suspended in a viscous medium carbonisable on heating and heating the coated body first to decompose the viscous medium and leave silicon and a carbon layer of open cellulse structure extending over the surface of the body and then, in the presence of molten silicon, to convert the carbon layer to a silicon carbide skeleton with open pores through which the molten silicon moves to accelerate siliconising of the green body.

4,477,494

PROCESS FOR FORMING RUST RESISTANT TIN OXIDE COATINGS ON GLASS CONTAINERS

Syed R. Ali-Zaidi, Shippenville, Pa., assignor to Glass Containers Corporation, Fullerton, Calif.

Filed Jul. 12, 1982, Ser. No. 397,154

Int. Cl.³ B05D *5/00, 1/02*

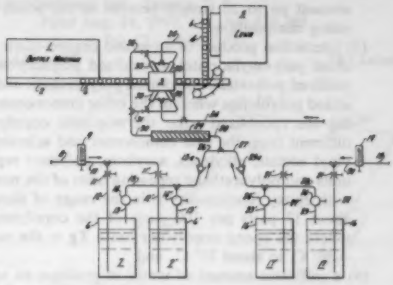
U.S. Cl. 427—255.3 **9 Claims**

1. In a process for the formation of a coating on a glass container by the formation of a tin oxide coating on the containers during passage through a tunnel adjacent the forming machine, wherein the bottles are at a temperature of between about 500°-720° C.; the improvement wherein said coating is rendered rust resistant and the scratch resistance thereof is enhanced by:

passing dry air through a bath of tin tetrachloride to form a first fluid stream;

passing dry air through a bath of a phosphorous halide, selected from the group consisting of phosphorous trichloride or phosphorous oxychloride, to form a second fluid stream;

combining the first and second fluid streams, and intimately mixing said streams, to form a fluid coating stream comprising air containing tin tetrachloride and said phosphorous halide in a ratio, by weight, of between 2:1 and 9:1; combining said fluid coating stream with additional air, and



introducing said fluid coating stream combined with said additional air into said tunnel for contact with containers passing therethrough, whereby said rust resistant, scratch resistant coating is formed on said containers.

4,477,495

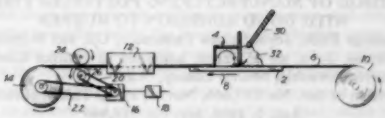
METHOD AND APPARATUS FOR PREPARING THERMOPLASTIC COATED WEBS AND PRODUCTS THEREOF

Michael Ring, Warwick, N.Y., and William K. Kirk, Carey, N.C., assignors to International Paper Company, New York, N.Y.

Filed Nov. 9, 1982, Ser. No. 440,412

Int. Cl.³ B05C *3/02*; B05D *3/12*

U.S. Cl. 427—356 **52 Claims**



36. Method of coating a web, which comprises the steps of:

(a) moving the web;

(b) applying coating materials to the moving web;

(c) passing the web and coating material into and through a confined zone; and

(d) restricting the rate at which the coating material on the web leaves te confined zone whereby said coating material accumulates in the confined zone and builds up an internal hydrostatic pressure which tends to drive it into the web.

4,477,496

PROCESS FOR PREPARING SIZED GLASS FIBER ROVING

Balbhadra Das, and L. Dow Moore, both of Allison Park, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 363,197, Mar. 29, 1982, Pat. No. 4,435,474, which is a division of Ser. No. 273,791, Jun. 15, 1981, Pat. No. 4,338,233. This application Dec. 19, 1983, Ser. No. 562,903

Int. Cl.³ B05D *3/02*; D02G *3/00*

U.S. Cl. 427—375 **2 Claims**

1. In a process for preparing sized glass fiber roving for use in preparing sheet molding compound, bulk molding compound or thick molding compound, the Improvement comprising:

(a) treating the glass fibers during their formation with an aqueous sizing composition comprising:

(1) a major amount of the solids of the sizing composition being one or more cross-linkable film forming polymers compatible with the matrix polymer,

(2) one or more organo-silane coupling agents in an amount up to 20 weight percent of the solids in the sizing composition,

(3) interaction product of an amino organo-silane epoxidized polyvinylacetates, epoxidized polyacrylates, epoxidized polyesters, epoxidized polyurethane and epoxidized polyolefins wherein the other comonomer forming the epoxidized polar thermoplastic copolymer is different from the first comonomer and selected from vinyl acetate, alkylenes, acrylates, polyester repeating units and polyurethane repeating units of the monomer with epoxy functionality is in the range of about 2 to about 12 parts per 100 parts of the copolymer, and where the epoxy copolymer has a Tg in the range of −10° C. to about 70° C., and

(4) a sufficient amount of water to produce an aqueous sizing composition having a solids content in the range of about 2 weight percent to about 30 weight percent;

(b) gathering the treated glass fibers into one or more treated glass fiber strands,

(c) drying the treated glass fiber strand or strands at a temperature above about 100° C. for more than one hour to remove almost all of the moisture from the strand or strands,

(d) gathering a plurality of dried glass fiber strands,

(e) heating the plurality of dried glass fiber strands at a temperature above about 100° C. for a time sufficient to cause the epoxidized polar thermoplastic polymer to flow between the strands, and

(f) collecting the plurality of glass fiber strands into a roving package.

4,477,497

METHOD OF MANUFACTURING POLYESTER FIBERS WITH GOOD ADHESION TO RUBBER

Kazushige Kudo, Joyo; Shigeo Yamamoto, Uji, and Shigemitsu Murase, Joyo, all of Japan, assignors to Unitika Limited, Morris Township, Morris County, N.J.

Division of Ser. No. 317,666, Nov. 2, 1981,. This application Aug. 1, 1983, Ser. No. 519,160

Claims priority, application Japan, Nov. 11, 1980, 55-159021

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—386 **7 Claims**

1. A method of producing polyester fiber with improved adhesion to rubber comprising

(i) applying to the fiber a finish composition comprising a lubricant and

(a) about 5 to 50 weight percent of an epoxy compound, and

(b) about 3 to 30 weight percent of a novolak resin, and

(ii) heating the fiber at a temperature of about 150° to 250° C. for up to several seconds.

4,477,498

PROCESS FOR THE PRODUCTION OF PERFLUOROALKYL RESIDUE CONTAINING CONDENSATION PRODUCTS, THE CONDENSATION PRODUCTS PREPARED ACCORDINGLY, AND THEIR USE

Hans Deiner, Neusaess; Franz Mosch, Gessertshausen; Bernhard Sandner, and Willy Bernheim, both of Diedorf, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 13, 1982, Ser. No. 408,084

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1981, 3133303

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—389.9 **8 Claims**

1. A condensation product obtained by mixing

(A) 1 mol of hexamethylolmelamine, highly etherified with a C_1- to C_4-alcohol, with

(B) 3 to 6 moles of a thiol of the formula R_f—X—SH, wherein R_f is perfluoroalkyl of 4 to 14 carbon atoms and X is the divalent radical of ethylene or isopropylene, and allowing compounds (A) and (B) to react over a period of at least about 40 minutes while the reaction temperature is increased to at least 145° C.

4,477,499

THERMOFORMABLE SILICONE RESIN COATING COMPOSITION AND DUAL COMPONENT COATING SYSTEM FOR POLYCARBONATE

James E. Doin, Hoosick Falls, and Howard A. Vaughn, Jr., Schenectady, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Sep. 7, 1982, Ser. No. 415,457

Int. Cl.³ C08K *3/36*; C08L *69/00*; C08G *77/00*

U.S. Cl. 427—412.1 **15 Claims**

1. A thermoformable silicone resin coating composition comprising a colloidal silica filled thermoset organopolysiloxane containing a silylated ultraviolet radiation screening compound and a small amount of a Lewis acid compound.

6. A method for providing a thermoformable coating on polycarbonate substrates which comprises the steps:

(A) applying to a polycarbonate substrate an extensible primer composition comprising from about 0.5 to about 10 parts by weight of a thermoplastic acrylic polymer in about 99.5 to about 90 parts by weight of a volatile solvent, and thereafter

(B) applying a thermoformable silicone resin coating composition as defined in claim 1.

4,477,500

EYE INSERT FOR TAXIDERMY FORM

Leon T. Powell, Rte. 13, Box 52, Salisbury, N.C. 28144

Filed Apr. 4, 1983, Ser. No. 481,778

Int. Cl.³ A63H *3/38*

U.S. Cl. 428—16 **9 Claims**

1. An eye insert for a taxidermy form having a preformed eye socket, wherein the eye insert and eye socket cooperate to automatically align the eye insert to an anatomically correct position and appearance while permitting a narrow range of adjustment of the insert relative to the socket, said eye insert comprising:

(a) an artificial eyeball;

(b) a base which is smaller than the eye socket opening and into which the eyeball is adapted to be partially set, said base configured to be positioned within the eye socket of the taxidermy form; and,

(c) alignment means carried by said base and the eye socket for positioning the base in a predetermined alighment in the eye socket and for permitting the eye insert to be manually adjusted within the eye socket within a narrow range of adjustment in order to achieve a completely life-like appearance before being fixed against further movement.

4,477,501

WELDED CAN AND PROCESS FOR PREPARATION THEREOF

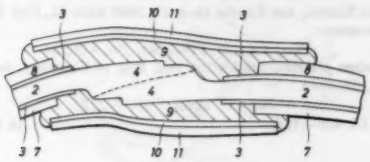
Shunji Kojima; Tadahiko Katsura, both of Yokohama; Hiroshi Ueno, Yokosuka; Kazuo Taira, Tokyo, and Tsuneo Imatani, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 225,994, Jun. 19, 1981,. This application Nov. 19, 1982, Ser. No. 443,213

Claims priority, application Japan, Jan. 18, 1980, 55-3502

Int. Cl.³ B65D *65/40*

U.S. Cl. 428—35 16 Claims



1. A coated welded can comprising a metal can body having a longitudinal seam formed by lapping both edges of a can blank and welding the lapped edges and a coating covering a metal-exposed face inclusive of the seam,

wherein said coating comprises a laminate comprising (a) a layer comprised of a copolymer of ethylene with a carbonyl group-containing, ethylenically unsaturated monomer or a blend containing said copolymer, (b) a layer of a heat-resistant resin having a melting point or softening point higher than that of said copolymer or blend and (c) a metal film interposed between said two layers, said layer of the copolymer or blend of the laminate tape being subjected to corona discharge treatment prior to the application to the metal-exposed face, and said laminate being applied to the metal-exposed face in such relation that the layer (a) of said copolymer or the blend thereof is located on the metal-exposed face and adheres to said metal-exposed face by fusion of the layer (a).

4,477,502

PLASTIC SHEET HAVING HIGH GLOSS AND LOW COEFFICIENT OF FRICTION AND METHOD FOR PRODUCING THE SAME

Eileen F. O'Sullivan, Rochester, N.Y., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 360,388, Mar. 22, 1982, abandoned. This application Apr. 29, 1983, Ser. No. 490,117

Int. Cl.³ B32B *1/02, 3/30*

U.S. Cl. 428—35 4 Claims

1. A plastic sheet having a high gloss and low coefficient of friction surface comprising a layer of thermoplastic material with a smooth surface interrupted by randomly distributed prominences having an average area of less than 16,000 square microns, an average height of about 5 microns, a standard deviation of the height of the prominences about the average of less than 3 microns, and an average frequency of the prominences over the surface of the sheet of 3,000 per square centimeter, the prominences being substantially convex and rounded about their peripheries.

4,477,503

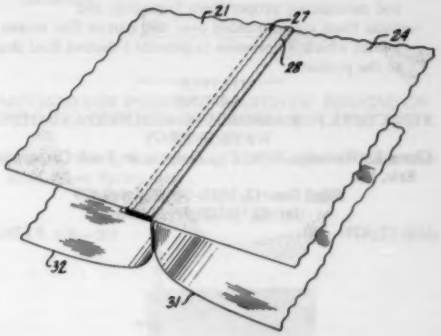
AIR SUPPORTED STRUCTURES HAVING INTERNAL LINERS

Donato M. Fraioli, Mamaroneck, N.Y., assignor to Air Structures International Inc., Tappan, N.Y.

Filed Aug. 31, 1982, Ser. No. 413,265

Int. Cl.³ E04B *1/00*

U.S. Cl. 428—102 14 Claims



1. An air supported structure comprising: a sheet-like flexible member dimensioned and configured to define an air supported structure that is inflatable when disposed upon a surface on which the air supported structure is to be erected, said sheet-like member comprising a plurality of flexible panels joined together along adjacent marginal edge portions which define flexible seams of said sheet-like member; means for joining said adjacent marginal edge portions of said plurality of panels; strips of material disposed on respective flexible seams of said sheet-like member within the air structure, said strips of material extending along the lengths of said flexible seams and said strips of material each having a tab portion extending along the length of said strips of material and freely depending from said sheet-like member when the air supported structure is in an inflated and air-supported condition; liner panels spanning between said tabs, attached to said depending tabs and depending from said sheet-like member within the air supported structure when said sheet-like member is in an inflated and air-supported condition, said liner panels together comprising a liner of the air supported structure; and means for attaching said liner panels to said depending tabs.

4,477,504

UTILIZATION OF PLASTIC FILMS TO CONTROL GAS PRESSURE AND REDUCE FOAM IN CELLULAR FOAM PRODUCTS

Larry E. Bailey, West Branch, and Edward B. Morello, Iowa City, both of Iowa, assignors to Sheller-Globe Corporation, Toledo, Ohio

Filed Aug. 17, 1982, Ser. No. 408,792

Int. Cl.³ B32B *3/10, 5/20*

U.S. Cl. 428—138 24 Claims

1. A composite substrate and cellular foam product comprising:

a generally rigid load supporting member having holes and openings therein;

plastic barrier film means vacuum bonded over exterior portions of said load supporting member, said barrier film means being operative to render said exterior portions of said load supporting member impervious to reaction products which are generated during formation of said cellular foam and to define a seal extending across said holes and openings for inhibiting passage of said reaction products through said holes and openings to assist in controlling and maintaining proper foam formation; and

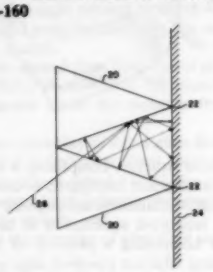
cellular foam means molded over said barrier film means in a form which is operative to provide a desired final shape to the product.

4,477,505

STRUCTURE FOR ABSORBING ACOUSTIC AND OTHER WAVE ENERGY

Glenn E. Warnaka, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Dec. 13, 1982, Ser. No. 449,479
Int. Cl.³ B32B *3/12, 5/18*
U.S. Cl. 428—160 9 Claims



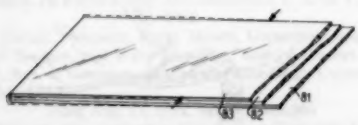
1. A structure for absorbing wave energy comprising the combination of a wall, ceiling or floor support member, and a plurality of wedge-shaped elements of sound-absorbing material, each of said elements having an essentially flat base portion for initial absorption of wave energy and an oppositely-disposed apex portion affixed to said support member for absorbing residual wave energy passing from said flat base portion, the elements being arranged in side-by-side relationship with their base portions in abutting edge-to-edge relationship outwardly of said support member to form an essentially contiguous planar surface for initial impingement and absorption of wave energy with the apex portion of each element extending away from said planar surface on one side thereof to said support member for trapping residual wave energy which permeates beyond said contiguous planar surface.

4,477,506

METHOD AND APPARATUS FOR MAKING IMPROVED LAMINATING FILM AND IMPROVED FILM

James C. Wang, Libertyville, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Filed Jun. 24, 1982, Ser. No. 391,874
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—172 3 Claims



1. An improved laminating film having one outer film having a surface composed of an optically clear, biaxially oriented polyester resin,

a second outer film having a surface composed of an ethylene-vinyl acetate copolymer, and

an intermediate film interposed between said first and second films and bonding the same together, said intermediate film comprising an ethylene-vinyl acetate copolymer having a higher content of vinyl acetate than said second outer film,

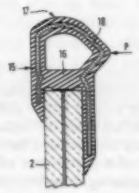
said second outer film being embossed to create a textured surface, said laminating film having a residual shrinkage not greater than 2%.

4,477,507

GLASS PANE FITTED WITH A VARIABLE PROFILE FRAME

Heinz Kunert, Am Krieler Dom 23, 5000 Köln 41, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,234
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1981, 3134340
Int. Cl.³ E06B *7/23, 7/232*
U.S. Cl. 428—188 16 Claims



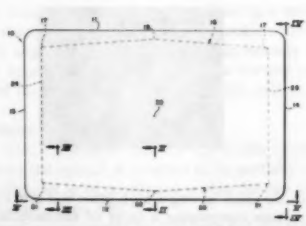
1. A molding for fitting a glass pane fitted to the frame forming a window opening in an automobile body, comprising a variable profile molding (**1, 15, 20, 25, 40**) adapted to surround the edge of a glass pane, said molding having a deformable segment (**6, 17, 22, 41**) which, viewed in cross section, lies outside the periphery of the glass pane (**2, 21, 45**) and a pair of spaced legs and a joining surface forming in cross section a shaped channel within which the outer peripheral edge of the glass pane is received and said segment being asymetrical in cross section and including a deformable reinforcing insert capable of controlled plastic deformation upon the application of a predetermined external force to controllably vary the profile of the molding.

4,477,508

EDGE TREATMENT TO PREPARE NON-CIRCULAR PLASTIC SHEETS FOR COMPRESSION STRETCHING

Robert B. Rau, Canyon Country, Calif., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 20, 1983, Ser. No. 515,404
Int. Cl.³ B32B *23/02;* B28B *11/08*
U.S. Cl. 428—192 16 Claims



1. A plastic sheet blank of non-circular outline having a geometric center, an upper major surface, a lower major surface and an edge surface interconnecting said major surfaces around the peripheral portion of said blank and having different portions spaced different distances from its geometric center, characterized by a circumferentially extending groove in said edge surface having a lesser depth of groove in its portion spaced a relatively short distance from said geometric

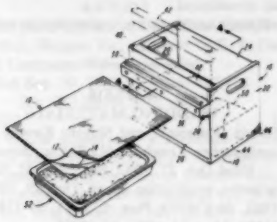
center and a greater depth of groove in its portion spaced a relatively long distance from said geometric center.

4,477,509

DISPOSABLE LID FOR POTS, PANS AND LIKE RECEPTACLES

Joseph J. Mott, 4865 Walden La., Kettering, Ohio 45429

Filed Aug. 19, 1982, Ser. No. 409,454
Int. Cl.³ B32B *15/08*
U.S. Cl. 428—198 **9 Claims**



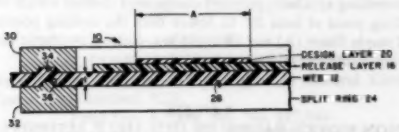
1. A disposable lid for pans, pots and other receptacles, particularly advantageous for use in ovens, comprising a plurality of layers of thin flexible material, the outer of said layers being a heat reflective foil and an inner of said layers being a relatively thin plastic film the body of which, per se, has a direct bearing contact with and an adherence, at least in part, to said outer layer of foil to form therewith a unitized sheet structure distinguished by the absence of adhesive and the absence of a modification of said inner layer, said sheet structure being adapted to adhere to surface portions of the receptacle to which it applies.

4,477,510

DECALCOMANIA

Ronald E. Johnson, Tioga, Pa., and Lung-ming Wu, Horseheads, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,511
Int. Cl.³ B32B *3/18;* B41M *3/12, 5/26*
U.S. Cl. 428—200 **5 Claims**



1. A heat release decal for application to a shaped surface of an article comprising:

a support web formed of a disposable stretchable film of low density polyethylene having a tensile strength of between about 1000 PSI and 6000 PSI, said web being uniformly stretchable by between about 120% and 1200% and having a thickness of about 1.0 mil to 4 mil;

a release layer, deposited on said support web, formed of an organic wax having a melt point between about 40° C. and 70° C.;

and at least one design layer deposited on said release layer as a cohesive film, formed of heat-processable thermoplastic ink having a melt point higher than that of the release layer;

said thermoplastic ink being formed of a material which, when heated to near the melt point of the release layer, becomes tacky; has an affinity for the surface of the article; and remains cohesive, such that when the decal is heated above the melt point of the release layer, and the design layer is placed in contact with the article, the design layer adheres to the article and releases from the web;

each of the web, the release layer and the design layer of the decal being formed of materials which do not migrate into each other during formation of the decal and upon application to the article;

and the release layer and design layer each being stretchable with the web for conforming with the shaped surface of the article.

4,477,511

METHOD FOR PRODUCING ARTISTIC DESIGNS ON THIN LAYER CHROMATOGRAPHY PLATES AND PRODUCT

Richard E. Hanig, Gaithersburg, Md., assignor to Ronia Garnicki, Silver Spring, Md.

Filed Sep. 15, 1982, Ser. No. 418,206
Int. Cl.³ B32B *3/18;* B05D *1/36*
U.S. Cl. 428—201 **22 Claims**

1. A decorative artistic article comprising;

a chromatographic plate having a dyestuff design placed thereon in an irregular pattern by placing a pattern producing color source having folds which form a pattern and solvent reservoir upon said plate and removing said pattern producing color source and solvent reservoir when said pattern has developed through the intermixing of the solvent and the color source to a suitable decorative or artistic state, and

wherein said solvent reservoir is a liquid absorbent material which holds said solvent and said reservoir is selected from the group of coffee grinds, with saw dust and cotton.

2. The article of claim 1 further including a protective coating placed over said chromatographic plate.

4,477,512

FLEXIBILIZED FLAME RETARDANT B-STAGED EPOXY RESIN PREPREGS AND COMPOSITE LAMINATES MADE THEREFROM

Wilbur R. Thomas; Fred E. Hickman, III, and George J. Knight, all of Hampton, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1983, Ser. No. 490,061
Int. Cl.³ B32B *5/06*
U.S. Cl. 428—236 **18 Claims**

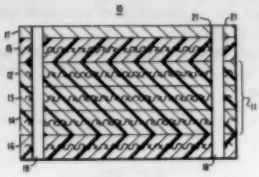
1. A flexibilized, "B"-staged resin impregnated porous substrate, the impregnating resin comprising a mixture of:

A. a brominated epoxy resin, or a mixture of a non-halogenated epoxy resin and a flame retarding reactive additive containing bromine and phenolic hydroxyl groups,

B. an epoxidized oil, wherein the oil is naturally occurring unsaturated fatty oil, and

C. phenolic novolac oligomer curing agent having an aver-

age of over 2.5 phenolic hydroxyl groups per oligomeric unit, where the porous substrate is selected from the group

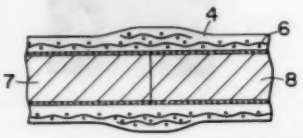


consisting of cellulosic paper and unwoven fibrous glass sheet.

4,477,513
LAMINATE

Hitoshi Koga, Iwakuni, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 21, 1980, Ser. No. 151,833
Claims priority, application Japan, May 28, 1979, 54-70664[U]
Int. Cl.³ B32B 7/00
U.S. Cl. 428—246 6 Claims



1. A rigid laminate which comprises a sandwich plate composed of two outer layers of a metal and an inner layer of a thermoplastic resin sandwiched in between the outer layers, at least one exterior surface of the sandwich plate having a fiber reinforced organic resin layer laminated thereon, said fiber being in the form of a filament winding

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4,477,514
METHOD FOR TREATING CELLULOSIC TEXTILE FABRICS WITH AQUEOUS EMULSIONS OF CARBOXYFUNCTIONAL SILICONE FLUIDS

Ronald P. Gee, Midland, and Robert E. Kalinowski, Auburn, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 14, 1983, Ser. No. 551,756
Int. Cl.³ B32B 27/12; B05D 3/02
U.S. Cl. 428—264 23 Claims

1. A method for improving properties of a cellulosic textile fabric, said method comprising

I. impregnating said cellulosic textile fabric with an aqueous emulsion, said emulsion comprising a combination of

(A) 0.1 to 60 percent by weight, based on the total weight of the emulsion, of a carboxyfunctional silicone fluid having the general formula

$$QMe_2SiO(Me_2SiO)_x(MeRSiO)_ySiMe_2Q$$

wherein in said formula there is 0.5 to 10 mole percent of the units (MeRSiO) present, 90 to 99.5 mole percent of (Me_2SiO) units present and the total number of units in the molecule is 30–300,

Me is a methyl radical

R is a carboxyfunctional radical, said carboxyfunctional radical being selected from the group consisting of carboxyalkyl radicals and carboxythioalkyl radicals,

Q is selected from the group consisting of R, Me and OH groups,

x has a value of 27 to 297,

y has a value of 1 to 30;

(B) 0.01 to 10 percent by weight, based on the total weight of the emulsion, of a nonionic surfactant having an HLB value of 14.5 to 16.7, and

(C) 30 to 99.89 percent by weight, based on the total weight of the emulsion, of water, and

II. applying a sufficient amount of heat to the impregnated textile fabric to render the carboxyfunctional silicone fluid crosslinked.

18. A cellulosic textile fabric treated by the method of claim 1.

4,477,515
WADDING MATERIALS

Yugoro Masuda, Takatsuki, and Shigeru Kawase, Nara, both of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Oct. 27, 1982, Ser. No. 437,765
Claims priority, application Japan, Oct. 29, 1981, 56-174049; Oct. 31, 1981, 56-174793; Nov. 6, 1981, 56-178538; Mar. 17, 1982, 57-43384; Mar. 17, 1982, 57-43385
Int. Cl.³ D04H 1/58
U.S. Cl. 428—288 36 Claims

1. A wadding material in the form of a plurality of fibrous masses of entangled fibers each having a diameter in the range of 10 to 50 mm and a density of less than 0.03 g/cm³, said fibrous masses consisting essentially of a mixture of (I) 100 parts by weight of a blend of (1) 90% to 10% by weight of staple fibers (A) selected from natural and synthetic fibers suitable for use in wadding materials, said staple fibers (A) having a monofilament fineness in the range of 3 to 10 deniers and a curliness of not less than 15%, and (2) 10% to 90% by weight of staple fibers (B) made of synthetic polymer suitable for use in wadding materials having a monofilament fineness in the range of 0.7 to 4 deniers and a curliness of less than 15%, the fineness of said staple fibers (B) being less than the fineness of said staple fibers (A), in which the curliness of said staple fibers (A) and (B) is equal to $(B-A)/B\times 100\%$, wherein A is the fiber length under a load of 2 mg/denier and B is the fiber length under a load of 50 mg/denier; and (II) 2 to 100 parts by weight, per 100 parts by weight of said blend, of low-melting synthetic fibers suitable for use in wadding materials having a low-melting synthetic polymer component thereof which has a melting point at least 20° C. lower than the melting points of said staple fibers (A) and (B), said low-melting synthetic fibers having a fineness of from 1 to 15 deniers.

4,477,516
NON-WOVEN FABRIC OF HOT-MELT ADHESIVE COMPOSITE FIBERS

Taizo Sugihara, Moriyamashi; Yasuhiko Furukawa, Kusatsushi, and Susumu Tomioka, Shigaken, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Jun. 27, 1983, Ser. No. 508,223
Claims priority, application Japan, Jun. 29, 1982, 57-111967
Int. Cl.³ D02G 3/00; D04H 1/04
U.S. Cl. 428—296 10 Claims

1. A non-woven fabric of hot-melt-adhesive composite fibers having a weight per unit area of 8 to 30 g/m² obtained by

(1) forming a fiber aggregate consisting of hot-melt-adhesive composite fibers of 4 deniers or less, composed of

(a) as a first component a polyethylene resin composition (C) consisting of

(A) 50 to 100% by weight of a straight chain low density polyethylene (L-LDPE) and

(B) 50 to 0% by weight of another kind of polyethylene, said first component having a density of 0.910 to 0.940 g/cm³ and a ratio of its melt index after spinning:before spinning of 0.75 or higher, and

(b) as a second component a fiber-formable polymer hav-

ing a melt point higher than those of either polyethylenes (A) or (B) by 30° C. or more,

the first component constituting at least a part of the fiber surface of the composite fibers continuously in the longitudinal direction thereof,

(2) subjecting the fiber aggregate to heat treatment at a temperature equal to or higher than the melt point of the first component of the composite fibers but lower than the melting point of the second component thereof to stabilize the shape by hot melt adhesion.

4,477,517
MULTILAYER SILICONE COATING

Mitzie K. Rummel, Secane, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1982, Ser. No. 427,476
Int. Cl.³ B32B *5/16, 15/08*
U.S. Cl. 428—324 **11 Claims**

1. A coated article comprising a substrate coated with a coating having at least two layers, which include a primer and a topcoat, the primer being directly in contact with the substrate and the topcoat being on the side of the primer away from the substrate, with or without intermediate coats between the primer and the topcoat,

said primer consisting essentially of a silicone resin, a silicone oil and optionally pigments, and

said topcoat consisting essentially of a silicone resin, colloidal silica and a flake pigment selected from metal flake, mica, and pigment-coated mica.

4,477,518
COATED PAPERS AND CARDBOARDS AND PROCESS FOR THEIR MANUFACTURE

Sauveur Cremona, 4 rue Terechkova, 33130 Begles, and Joel Pijselman, 22 rue Andre Gide, 33400 Talence, both of France

Filed Sep. 30, 1981, Ser. No. 307,182
Claims priority, application France, Oct. 8, 1980, 80 21464
Int. Cl.³ B32B *23/06, 27/10*
U.S. Cl. 428—327 **17 Claims**

1. A paper or cardboard having a cellulose fiber base covered with at least one compressible coating layer comprising more than about 1 percent by weight of hollow microspheres filled with a gas that is inert with respect to the microsphere-forming material and at least one pigment of less than about 99 percent by weight of the coating.

4,477,519
DUAL COMPONENT COATING SYSTEM

Robert B. Frye, Albany, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 4, 1981, Ser. No. 327,448
Int. Cl.³ B32B *5/16, 27/36;* **B05D** *7/00*
U.S. Cl. 428—331 **20 Claims**

1. An article comprising a solid substrate, at least one surface of which is coated with

(a) an inner layer consisting of a primer coat comprising from 2% to 6% polymethylmethacrylate dissolved in a mixture of an ether solvent and ketone solvent containing an ultraviolet light absorbing compound, or a combination of an ultraviolet light absorbing compound and an ultraviolet radiation stabilizing agent, effective to increase the resistance of the coating to ultraviolet radiation; and

(b) an outer layer consisting of a silicone resin coating composition comprising a dispersion of colloidal silica in an aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, wherein at least 70 weight percent of the silanol is $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids, said solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said composition further containing an effective amount of an ultraviolet light absorbing compound which is not the same as that employed in component (a) and which is matched with said ultraviolet light absorbing compound of component (a) so as to effectively extend the service life of the coated substrate.

11. A process for protecting and extending the service life of a solid substrate comprising applying and curing on at least one surface of said solid substrate

(1) a primer coat comprising from 2% to 6% polymethylmethacrylate dissolved in a mixture of an ether solvent and ketone solvent containing an ultraviolet light absorbing compound, or a combination of an ultraviolet light absorbing compound and an ultraviolet radiation stabilizing agent, effective to increase the resistance of the coat to ultraviolet radiation; and

(2) a silicone resin coating composition comprising a dispersion of colloidal silica in an aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, wherein at least 70 weight percent of the silanol is $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids, said solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said composition further containing an effective amount of an ultraviolet light absorbing compound which is not the same as that employed in component (a) and which is matched with said ultraviolet light absorbing compound of component (a) so as to effectively extend the service life of the solid substrate.

4,477,520
MAGNETIC RECORDING MEDIA HAVING LUBRICATED CONTACT LAYER

Mitsuru Hamada, Yokohama; Toshio Kumai, Chofu, and Shoji Ishida, Hatano, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP80/00321, § 371 Date Aug. 12, 1981, § 102(e) Date Aug. 12, 1981, PCT Pub. No. WO81/01904, PCT Pub. Date Jul. 9, 1981
PCT Filed Dec. 23, 1980, Ser. No. 293,626
Claims priority, application Japan, Dec. 24, 1979, 54-166949
Int. Cl.³ G11B *5/72*
U.S. Cl. 428—336 **19 Claims**

1. A magnetic recording medium comprising a permanent substrate and a magnetic recording layer formed on at least one side of said substrate, said magnetic recording layer comprising a contact layer which includes a polymer material comprising as a major component an acryl resin and polyvinyl alkyl ether in an amount of from 5 to 30% by weight, based on the total weight of said polymer material, said polymer material being impregnated with a lubricant at least at the external surface of said magnetic recording layer.

11. A magnetic recording medium, comprising a substrte and a magnetic recording layer on at least one side of said substrate, a contact layer formed on each said magnetic recording layer, each said contact layer being of a polymer material comprising as a major component an acryl resin and 5 to 30% by weight of polyvinyl alkyl ether, said polymer material being impregnated with a lubricant.

4,477,521
LIGHT TRANSPARENT BODY OF COEXTRUDED SYNTHETIC RESIN

Jürgen Lehmann, Reinheim; Heinz Vetter, Rossdorf, and Wolfgang Arnold, Bensheim, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Apr. 12, 1982, Ser. No. 367,269

Claims priority, application Fed. Rep. of Germany, May 9, 1981, 8113747[U]

Int. Cl.³ B32B *27/36*

U.S. Cl. 428—336 **5 Claims**

1. A light transparent body comprising a first coextruded layer, at most 0.1 millimeter thick, of a first extrudable light-transparent synthetic resin and a second coextruded layer of a second extrudable light-transparent synthetic resin different from said first resin selected from the group consisting of a polycarbonate resin, polymethylmethacrylate resin and a synthetic copolymeric resin predominatly comprising methyl methacrylate, said first and second coextruded layers being adjacent, said first layer containing distributed homogeneously therethrough a dyestuff capable of fluorescing in the visible region under ultraviolet radiation, and said second layer being free of the dyestuff present in said first layer, whereby said first layer is detectible and distinguishable from said second layer when under ultraviolet radiation.

4,477,522
REINFORCING ELEMENT AND METHOD OF MAKING THE SAME

Richard W. Sheehan, Johnson City, Tenn., assignor to Sherwood Research Corporation, Johnson City, Tenn.

Filed Apr. 11, 1983, Ser. No. 483,662

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—359 **4 Claims**

1. A reinforcing element comprising a bundle of from about 15 to about 100 strands of reinforcing material, said strands being between about ½ inch and 2 inches in length, and said strands in said bundle being generally co-extensive and being interconnected by entangling said strands with one another in a limited area intermediate their ends to provide brushes of substantially unentangled strands on each side of said intermediate area.

4,477,523
FLAME RETARDANT CROSSLINKED POLYOLEFIN INSULATION MATERIAL

James W. Biggs, Lebanon, and Melvin F. Maringer, Cincinnati, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 371,688, Apr. 26, 1982, abandoned. This application Sep. 28, 1983, Ser. No. 536,825

The portion of the term of this patent subsequent to Sep. 14, 1999, has been disclaimed.

Int. Cl.³ C08K *5/38, 5/09, 3/22*; C08L *23/08*

U.S. Cl. 428—389 **30 Claims**

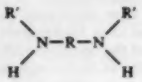
1. A crosslinkable polymeric composition having improved flame retardancy comprising:

(a) a copolymer of ethylene and a vinyl ester of a C_2–C_6 aliphatic carboxylic acid, a C_1–C_6 alkyl acrylate or C_1–C_6 alkyl methacrylate,

(b) from 80 to 400 parts of hydrated inorganic filler per 100 parts of copolymer,

(c) 0.4 to 8 parts of an alkoxysilane per 100 parts of hydrated inorganic filler, and

(d) a flame-retardant component containing a dual lubricant system comprising a fatty acid having from 8 to 25 carbon atoms and an alkylene-bis-amide having the general formula:



wherein

R=a divalent alkylene radical of from 2 to 8 carbon atoms; and

R'=

wherein R^2 is an aliphatic radical having from 8 to 25 carbon atoms,

a halogenated flame retardant and, optionally, antimony trioxide.

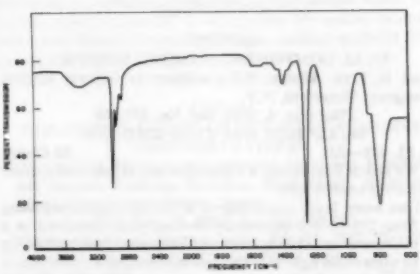
4,477,524
AQUEOUS SIZING COMPOSITION FOR GLASS FIBERS FOR USE ON CHOPPED GLASS FIBERS

Daniel G. Brown, Caroleen, and Donald L. Motsinger, Forest City, both of N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 268,541, May 29, 1981, Pat. No. 4,394,414. This application Sep. 23, 1982, Ser. No. 422,126

Int. Cl.³ B32B *9/00, 25/20*

U.S. Cl. 428—391 **23 Claims**



1. Wet chopped glass fiber strand produced by attenuating glass fibers from molten cones of glass from a bushing, sizing the glass fibers with an aqueous sizing composition, gathering the fibers into one or more strands and chopping the glass fiber strands to produce wet chopped glass fiber strands, THE IMPROVEMENT COMPRISING:

a. sizing the glass fibers with an aqueous sizing composition having at least a cationic lubricant, cationic curable silicon polymer emulsion and amide compound that is water soluble or dispersible to control the moisture content of the wet chopped glass fiber strands in the range of at least about 9 to about 20 weight percent.

4,477,525

GRAFT POLYESTERS AND SIZED TEXTILES

Robert B. Login, Woodhaven, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 213,536, Dec. 5, 1980, Pat. No. 4,367,308, which is a division of Ser. No. 121,762, Feb. 15, 1980, Pat. No. 4,275,176, which is a continuation of Ser. No. 937,690, Aug. 28, 1978, abandoned. This application Oct. 21, 1982, Ser. No. 435,785

The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.

Int. Cl.³ D02G 3/00

U.S. Cl. 428—395 5 Claims

1. A sized fiber comprising a synthetic fiber sized with a cross-linked graft polyester comprising the reaction product of

(A) a polyunsaturated vinyl monomer or mixture of said monomer with a monovinyl monomer with

(B) an unsaturated polyester which is the reaction product of

(1) at least one dicarboxylic acid reactant selected from the group consisting of dicarboxylic acids, corresponding dicarboxylic anhydrides, dicarboxylic acid esters, and their corresponding acyl halides and

(2) at least one polyhydric alcohol comprising (a) a diol or (b) a mixture of a diol and up to 20 mole percent of a polyhydric alcohol having a functionality greater than 2 based upon 100 mole percent of said polyhydric alcohol

wherein a minor effective proportion of said dicarboxylic acid reactant or said polyhydric alcohol reactant is α,β-ethylenically unsaturated.

4,477,526

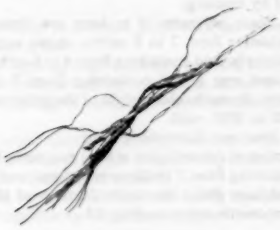
HIGH STRENGTH ARAMID SPUN YARN

Herbert G. Lauterbach, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 18, 1982, Ser. No. 389,622

Int. Cl.³ D02G 3/00

U.S. Cl. 428—399 4 Claims



1. A sliver of stretch broken, high strength, high modulus p-aramid fibers of which at least 50% of the fiber ends are fibrillated into at least 5 fibrils along a terminal length which is at least 50 times as long as the diameter of the unfibrillated portion of each fiber.

4,477,527

SHAPES FOR SEALING OR JOINING MATERIALS TOGETHER

George J. Grosner, Newton, Conn., assignor to Vitta Corporation, Wilton, Conn.

Filed Sep. 30, 1982, Ser. No. 431,652

Int. Cl.³ C08K 3/08

U.S. Cl. 428—401 8 Claims

1. A flexible brazing composition comprising, as a matrix, a minor proportion of an organic polymer as a binder and a major proportion of a braze alloy, said composition made and shaped by extrusion.

4,477,528

SILICONE RESIN COATING COMPOSITION ESPECIALLY SUITED FOR PRIMERLESS ADHESION TO CAST ACRYLICS

Robert B. Frye, Menands, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 34,164, Apr. 27, 1979, Pat. No. 4,413,088, which is a continuation-in-part of Ser. No. 964,911, Nov. 30, 1978, Pat. No. 4,277,287. This application Aug. 17, 1983, Ser. No. 524,091

Int. Cl.³ B32B 9/04; B05D 3/02

U.S. Cl. 428—412 23 Claims

1. A solid substrate having at least one surface coated with an aqueous coating composition comprising:

(i) a dispersion of colloidal silica in an aqueous-organic solvent solution of the partial condensate of a silanol of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, wherein said organic solvent comprises aliphatic alcohol and a mixture of water miscible polar solvents which are aggressive to plastic in an amount sufficient to etch plastic; and

(ii) a small amount effective to control flow of a polysiloxane polyether copolymer;

said composition containing 10 to 40 percent solids, said solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate and wherein said composition has a pH of from 7.1 to about 7.8.

4,477,529

PHOTOCURABLE POLYFUNCTIONAL ACRYLIC COATING AND DECORATIVE ARTICLES COATED THEREWITH

Richard W. Campbell, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 29, 1983, Ser. No. 566,626

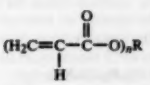
Int. Cl.³ B05D 3/06

U.S. Cl. 428—412 22 Claims

1. An ultraviolet light curable decorative coating composition for plastic substrates which coating comprises:

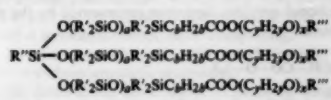
(i) from about 0.25% to about 5% by weight azobisisobutyronitrile;

(ii) at least one ultraviolet light curable cross-linkable polyfunctional acrylate monomer represented by the general formula:



wherein n is an integer having a value of from 2 to 4 inclusive, and R is selected from the group consisting of n valent hydrocarbon residue, n valent substituted hydrocarbon residue, n valent aliphatic hydrocarbon residue containing at least one ether linkage, and n valent substituted aliphatic hydrocarbon residue containing at least one ether linkage; and

(iii) from about 0.05% to about 3% by weight of a polysiloxane-polyether block copolymer, which is represented by the general formula:



where R′ and R″ are monovalent hydrocarbon radicals; R‴ is a lower alkyl radical; a has a value of about 2 to about 40; b has a value of 2 or 3; y has a value of 2 to 4

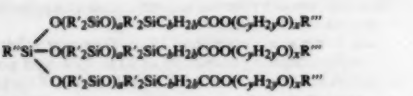
inclusive; and x has a value of about 5 to about 150, and optionally, a solvent.

8. A method for applying a decorative outer coating to a plastic substrate which method comprises:

(i) mixing from about 0.25 to about 5% by weight azobisisobutyronitrile, at least one ultraviolet light curable cross-linkable polyfunctional acrylate monomer represented by the general formula:

$$(H_2C{=}CH{-}CO{-}O)_nR$$

wherein n is an integer having a value of from 2 to 4 inclusive, and R is selected from the group consisting of n valent hydrocarbon residue, n valent substituted hydrocarbon residue, n valent aliphatic hydrocarbon residue containing at least one ether linkage, and n valent substituted aliphatic hydrocarbon residue containing at least one ether linkage, and from about 0.05 to about 3% by weight of at least one polysiloxane-polyether block copolymer surfactant represented by the general formula:



wherein R′ and R″ are monovalent hydrocarbon radicals, R‴ is a lower alkyl radical, a has a value from 2 to about 40, b has a value of 2 or 3, y has a value of from 2 to 4 inclusive, and x has a value of about 5 to about 150, which polysiloxane-polyether block copolymer may be dissolved in an optional organic solvent to form a surfactant mix;

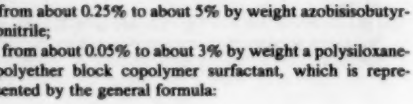
(ii) coating said plastic substrate with the mixture to a thickness of from about 0.5 to about 1 mil; and

(iii) photocuring the coating, thereby producing a translucent, frost-like, decorative coating.

15. An article comprising a plastic substrate coated with about 0.5 mil to about 1 mil of an ultraviolet light cured coating composition which coating comprises the photo-reaction products of:

(i) from about 0.25% to about 5% by weight azobisisobutyronitrile;

(ii) from about 0.05% to about 3% by weight a polysiloxane-polyether block copolymer surfactant, which is represented by the general formula:



wherein R′ and R″ are monovalent hydrocarbon radicals, R‴ is lower alkyl radical; a has a value from 2 to about 40; b has a value of 2 or 3; y has a value of from 2 to 4 inclusive; and x has a value of about 5 to about 150; and optionally, an organic solvent for a polysiloxane-polyether block copolymer surfactant mix; and

(iii) at least one ultraviolet light curable, cross-linkable, polyfunctional acrylate monomer represented by the general formula:

$$(H_2C{=}CH{-}CO{-}O{-})_nR$$

wherein n is 2, 3 or 4, and R is selected from the group consisting of a substituted or unsubstituted n valent hydrocarbon residue and a substituted or unsubstituted n valent hydrocarbon residue containing at least one ether linkage.

4,477,530

HEAT-HARDENABLE BINDER MIXTURE

Horst Diefenbach, Nottuln, and Michael Geist, Münster, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

PCT No. PCT/DE82/00015, § 371 Date Sep. 23, 1982, § 102(e) Date Sep. 23, 1982

PCT Filed Jan. 26, 1982, Ser. No. 425,078

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1981, 3103642

Int. Cl.³ B32B *27/38;* B05D *3/02*

U.S. Cl. 428—413 **26 Claims**

18. In a substrate coated with a binder mixture, the improvement comprising said binder mixture comprising:

(A) an organic resin having amino groups; and

(B) a cross-linking agent based on an organic compound which contains at least 2 β-hydroxyalkyl ester groups.

4,477,531

MAGNETIC STORAGE MEDIUM

Robert Kohler, Wessling; Burkhard Nippe, Munich; Heinrich Kober, Hohenschaeftlarn; Karlchristian Schilffarth, Sauerlach; Walter Meckel, Neuss, and Bernd Quiring, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Jul. 8, 1982, Ser. No. 396,238

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1981, 3127884

Int. Cl.³ G11B *5/68;* B32B *27/40*

U.S. Cl. 428—425.9 **9 Claims**

1. A magnetic storage medium consisting of a non-magnetic layer support and, applied thereto, at least one magnetisable layer containing finely particulate magnetic pigments and polyurethanes as binder, characterised in that the binder consists of from 25 to 100% of a thermoplastic polyurethane

having a hardness of from 80 to 100 Shore A, a tensile strength of from 30 to 75 MPa and a breaking elongation of from 320 to 520% and

substantially free from reactive terminal groups;

obtained by reacting:

(a) a linear polyester of at least one dicarboxylic acid containing from 2 to 8 carbon atoms and/or hydroxy carboxylic acid containing from 4 to 6 carbon atoms and at least one glycol containing from 2 to 12 carbon atoms, the molecular weight of the polyester being from 1200 to 6000, with

(b) at least one diisocyanate, and

(c) a mixture consisting of at least two straight-chain diols containing from 2 to 20 carbon atoms, and free of branchedchain diols, the molar fraction of the individual components not exceeding 0.8.

4,477,532

COMPOSITE STRUCTURES

Seymour Schmukler, Palatine; John Machonis, Jr., Schaumburg, and Mitsuzo Shida, Barrington, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 313,638, Oct. 22, 1981, abandoned, which is a division of Ser. No. 178,355, Aug. 15, 1980, abandoned. This application May 12, 1983, Ser. No. 493,798

Int. Cl.³ B32B *17/10, 15/08;* C08L *23/06, 23/10*

U.S. Cl. 428—441 **28 Claims**

1. A composite structure comprising:

(A) a substrate, and adhered thereto

(B) a modified polyolefin blend consisting essentially of about 0.1–40 parts by weight in said blend of a non-elastomeric graft copolymer of about 70–99.999 wt. % of a non-polar ethylene homopolymer or copolymer backbone having a density of at least about 0.915 grafted with about 30–0.001 wt. % of at least one grafting monomer comprising at least one polymerizable ethylenically unsaturated

carboxylic acid or carboxylic acid anhydride for a total of 100% and about 99.9–60 parts by weight of a substantially elastomer free blending resin mixture of about 25–75 wt. % of a linear low density polyethylene of a density of about 0.915 to less than 0.94, having a substantial absence of long-chain branching and a high degree of short-chain branching, and about 75–25 wt. % of a non-elastomeric polypropylene for a total of 100%.

15. A composite structure comprising:

(A) two or more substrates with adjacent pairs adhered together by

(B) an intervening layer of a modified polyolefin blend consisting essentially of about 0.1–40 parts by weight in said blend of a non-elastomeric graft copolymer of about 70–99.999 wt. % of a non-polar ethylene homopolymer or copolymer backbone having a density of at least about 0.915 grafted with about 30–0.001 wt. % of at least one grafting monomer comprising at least one polymerizable ethylenically unsaturated carboxylic acid or carboxylic acid anhydride for a total of 100% and about 99.9–60 parts by weight of a substantially elastomer-free blending resin mixture of about 25–75 wt. % of a linear low density polyethylene of a density of about 0.915 to less than 0.94, having a substantial absence of long-chain branching and a high degree of short-chain branching, and about 75–25 wt. % of a non-elastomeric polypropylene for a total of 100%.

4,477,533

LAMINATES CONTAINING INORGANIC STRUCTURAL MATERIALS

Cecil L. Phillips, Boughton, England, assignor to Scott Bader Company Limited, Northamptonshire, United Kingdom

Filed Oct. 5, 1982, Ser. No. 432,856

Claims priority, application United Kingdom, Oct. 6, 1981, 8130121; Jan. 18, 1982, 8201280

Int. Cl.³ B32B *13/06, 15/08*

U.S. Cl. 428—458 **4 Claims**

1. A rigid structural composite having a plurality of layers comprising:

a facing layer of a material selected from a metal and a thermosetting resin;

an adhesive layer having two faces, one said face bonded to one face of the facing layer, the said adhesive layer consisting essentially of a polyester-modified hyraulic cement; and

a structural rigid cementitious layer bonded to the second of the two said faces of the adhesive layer and consisting essentially of inorganic cement;

whereby the cementitious layer and facing layer are strongly bonded together by the adhesive layer.

4,477,534

AIR-DRYING HIGH-SOLIDS COATING COMPOSITIONS CONTAINING VINYL OXAZOLINE ESTERS AS REACTIVE DILUENTS

Joseph A. Antonelli, Riverton, N.J.; Joseph E. McLaughlin, Philadelphia, and Clifford H. Strolle, Springfield, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 18, 1982, Ser. No. 435,032

Int. Cl.³ C08L *25/04, 33/08, 33/10*

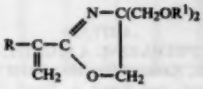
U.S. Cl. 428—461 **17 Claims**

1. A high solids coating composition comprising a dispersion, in a nonreactive organic solvent,

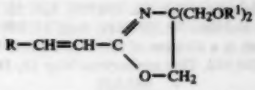
about 90–30% by weight of an air-drying resin having a backbone of polymerized monomers selected from the group consisting of alkyl methacrylates, alkyl acrylates, styrene or mixtures thereof and polymerized hydroxyl-containing monomers selected from the group consisting of hydroxyalkyl methacrylates, hydroxyalkylacrylates and mixtures thereof wherein the active hydrogen of at least one pendant hydroxyl group of the backbone is replaced by

R^2 being the residue of a drying-oil fatty acid, and

about 10–70% by weight of an air-drying vinyl oxazoline ester as a reactive diluent, the ester being selected from at least one member of the group consisting of



and



wherein

wherein the R's are residues of ethylenically unsaturated acids and the R^1's are residues of long-chain drying-oil fatty acids.

12. A metallic substrate carrying a cured film of a coating composition of claim 1.

4,477,535

COATED PAPERS

Alvin R. Sinclair, and Edward H. Gleason, both of Beaver, Pa., assignors to Polysar International S.A., Switzerland

Division of Ser. No. 279,951, Jul. 2, 1981, Pat. No. 4,413,068. This application May 9, 1983, Ser. No. 492,713

Int. Cl.³ B32B *27/10;* **B05D** *3/02;* **C08L** *9/08*

U.S. Cl. 428—476.3 **10 Claims**

1. In a method of manufacturing a coated paper having enhanced gloss and pick resistance the improvement comprising incorporating into the pulp or the paper coating composition a latex having a solids content of from about 40 to about 60 weight percent comprising heterogeneous polymer particles which have

(a) an initial domain, comprising from about 40 to about 60 percent by volume of the particles, which is a polymer of a monomer composition comprising:

(i) from about 55 to about 65 parts by weight of a monovinylidene aromatic monomer;

(ii) from about 45 to about 35 parts by weight of an aliphatic C_{4-6} conjugated diene monomer; and per 100 parts by weight of the total of said monovinylidene aromatic monomer and said aliphatic C_{4-6} conjugated diene monomer

(iii) from about 0.5 to about 5 parts by weight of a C_{3-6} ethylenically unsaturated carboxylic acid, an anhydride thereof, or mixtures thereof; and

(iv) from about 0.5 to about 5 parts by weight of a C_{3-6} ethylenically unsaturated primary amide or N-methylol acrylamide; and

(b) a subsequent domain, comprising from about 60 to about 40 percent by volume of the particles, which is a polymer of a monomer composition comprising:

(i) from about 75 to about 85 parts by weight of a monovinylidene aromatic monomer;

(ii) from about 25 to about 15 parts by weight of an aliphatic C_{4-6} conjugated diene monomer; and per 100 parts by weight of the total of said monovinylidene aromatic monomer and said aliphatic C_{4-6} conjugated diene monomer

(iii) from about 0.5 to about 5 parts by weight of a C_{3-6} ethylenically unsaturated carboxylic acid, an anhydride thereof, or mixtures thereof; and

(iv) from about 0.5 to about 5 parts by weight of a C_{3-6} ethylenically unsaturated primary amide or N-methylol acrylamide.

4,477,536

PROCESS FOR PREPARING A MULTILAYER COATING

Howard J. Wright, Kansas City, Mo.; David P. Leonard, Overland Park, Kans., and Roger A. Etzell, Farmington Hills, Mich., assignors to Glasurit America, Inc., Detroit, Mich.

Division of Ser. No. 359,307, Mar. 18, 1982, , which is a continuation-in-part of Ser. No. 256,959, Apr. 23, 1981, Pat. No. 4,377,661, and Ser. No. 297,631, Aug. 31, 1981, Pat. No. 4,414,357, each is a division of Ser. No. 98,115, Nov. 27, 1979, Pat. No. 4,290,932. This application May 11, 1983, Ser. No. 493,620

Int. Cl.³ B32B *27/30*; B05D *3/02*

U.S. Cl. 428—522 **27 Claims**

1. A process for preparing a multilayer coating on a substrate consisting of at least one base coating containing pigments on said substrate and at least one transparent top coating on said base coating with improved pigment settling on storage of said base coating material, and excellent pigment orientation in said multilayer coating, comprising:

(1) applying a coating composition as said base coating consisting essentially of

(a) 10 to 60% by weight of a film-forming synthetic resin;

(b) 40 to 80% by weight of an organic solvent in which said synthetic resin is soluble;

(c) 2.5 to 25% by weight of polymer microparticles having ionic or a mixture of polar and ionic groups on their surfaces and having a diameter of 0.01 to 5 microns prepared by emulsion-polymerizing ethylene-unsaturated monomers in an aqueous phase, at least one of said monomers selected from the group consisting of acrylic acid, methacrylic acid, and substituted alkyl esters thereof and containing a polar functional group and at least another of said monomers selected from the group consisting of an alkyl ester of acrylic acid, an alkyl ester of methacrylic acid, styrene and methyl styrene, said another of said monomers free of polar functional groups and a multi-functional crosslinking agent present in an amount of 5 to 70% by weight of the total weight of said ethylenically unsaturated monomers and said crosslinking agent, said crosslinking agent crosslinking said microparticles to a degree that said polar and said ionic groups are fixed on the surface of said microparticles, and subsequently removing water from said aqueous phase, said microparticles being insoluble in the solution of said synthetic resin in said organic solvent, and having said polar and ionic groups fixed on the surfaces, rearrangement of said polar and ionic groups into the particle interior being prevented by the crosslinking from said crosslinking agent; and

(d) 2 to 40 weight percent pigments

(2) applying said transparent top coating on said base coating; and

(3) curing (1) and (2) together to form a crosslinked transparent top coat film upon a base coat film.

12. The process of claim **1**, wherein said pigments (d) are metallic pigments.

14. A coated substrate having a multilayer coating thereon prepared by the process of claim **12**.

4,477,537

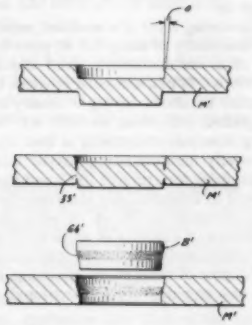
METHOD FOR PRODUCING BURR-FREE BLANKS AND THE BLANKS PRODUCED THEREBY

Robert Blase, and John G. Blase, both of Fairfield, Conn., assignors to Blase Tool and Manufacturing Co., Inc., Stratford, Conn.

Filed Sep. 23, 1982, Ser. No. 422,357

Int. Cl.³ B21D *28/16*

U.S. Cl. 428—577 **10 Claims**



1. A method for manufacturing a burr-free blank from an elongated sheet of flat metal stock comprising

punching a first aperture in one surface of said metal stock, said first aperture extending only partially through said stock;

simultaneously forming a lower burnished land portion of said blank;

punching a second aperture in the opposite surface of said metal stock, coaxial with said first aperture, said second aperture extending only partially through said stock, said second aperture being smaller than said first aperture;

simultaneously forming an upper burnished land portion of said blank, causing the material of said stock to fracture between said burnished land portions and recovering said burr-free blank.

9. A burr-free metal blank exhibiting a shiny upper peripheral burnished land portion, a rough, fractured intermediate peripheral portion and a shiny lower peripheral burnished land portion, said lower land portion having a smaller circumference than said upper land portion.

4,477,538

PLATINUM UNDERLAYERS AND OVERLAYERS FOR COATINGS

Robert L. Clarke, Riva, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 17, 1981, Ser. No. 235,051

Int. Cl.³ B32B *0/4*

U.S. Cl. 428—656 **6 Claims**

1. A composite article of manufacture consisting of a coating applied to a substrate for use in high temperature, corrosive environments said coating consisting of:

a platinum type metal underlayer applied to the substrate, said platinum type metal material selected from the group consisting of platinum, palladium, iridium, and rhodium;

an MCrAlY alloy intermediate layer applied to the platinum type metal underlayer, said MCrAlY alloy consisting of chromium, aluminum, at least one element selected from the group consisting of yttrium and the rare earth elements, and the balance (M) selected from the group consisting of cobalt, iron, and nickel; and

a platinum type metal overlayer applied to the MCrAlY intermediate layer, said platinum type metal selected from the group consisting of platinum, palladium, iridium, and rhodium, wherein the MCrAlY intermediate layer consists of, by weight, about 20–40% chromium, about 5–15% aluminum, about 0.1–0.5% yttrium, and the balance of cobalt.

3. A composite article of manufacture consisting of a coating applied to a substrate for use in high temperature, corrosive environments said coating consisting of:

a platinum type metal underlayer applied to the substrate, said platinum type metal material selected from the group consisting of platinum, palladium, iridium, and rhodium;

an MCrAlY alloy intermediate layer applied to the platinum type metal underlayer, said MCrAlY alloy consisting of chromium, aluminum, at least one element selected from the group consisting of yttrium and the rare earth elements, and the balance (M) selected from the group consisting of cobalt, iron, and nickel, and

a platinum type metal overlayer applied to the MCrAlY intermediate layer, said platinum type metal selected from the group consisting of platinum, palladium, iridium, and rhodium, wherein the MCrAlY intermediate layer consists of, by weight, from about 20% to about 35% chromium, from about 5% to about 15% aluminum, about 0.1–0.7% yttrium, and the balance of iron.

5. A composite article of manufacture consisting of a coating applied to a substrate for use in high temperature, corrosive environments said coating consisting of:

a platinum type metal underlayer applied to the substrate, said platinum type metal material selected from the group consisting of platinum, palladium, iridium, and rhodium;

an MCrAlY alloy intermediate layer applied to the platinum type metal underlayer, said MCrAlY alloy consisting of chromium, aluminum, at least one element selected from the group consisting of yttrium and the rare earth elements, and the balance (M) selected from the group consisting of cobalt, iron, and nickel; and

a platinum type metal overlayer applied to the MCrAlY intermediate layer, said platinum type metal selected from the group consisting of platinum, palladium, iridium, and rhodium, wherein the MCrAlY intermediate layer consists of, by weight, from about 20.0% to about 45.0% chromium, from about 5.0% to about 15% aluminum, from about 0.1% to about 0.5% yttrium, and the balance of nickel.

4,477,539
METAL/GAS FUEL CELL

Ralph C. Struthers, 39503 Calle El Fuente, Saugus, Calif. 91350

Filed Jan. 18, 1983, Ser. No. 458,835
Int. Cl.³ H01M *120/6*
U.S. Cl. 429—19 **22 Claims**

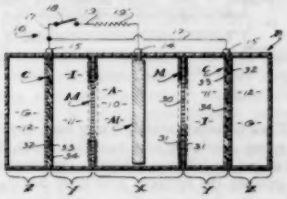
1. A metal gas fuel cell comprising:

(a) an anode chamber, a base anolyte solution in the anode chamber and an anode plate of metallic fuel immersed in the anolyte;

(b) an ion exchange chamber and a base ionolyte solution in the ion exchange chamber;

(c) a cationic membrane between the anode and ion exchange chambers separating the anolyte and ionolyte and having opposite surfaces in contact with and wetted thereby;

(d) a cathode plate adjacent the ion exchange chamber remote from the cationic membrane and having one surface contacting and wetted by the ionolyte and another surface in contact with a cathode fuel gas, said cathode plate is a layered structure including a layer of hydrophyllic material in contact with and wetted by the ionolyte, a layer of gas permeable hydrophobic material in contact with the gas and a gas and liquid permeable current collector of inert material with catalytic surfaces within the layer of hydrophyllic material;

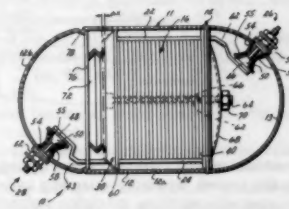


(e) an external electric circuit connected with the anode and cathode plates and conducting electrons from the anode plate to the cathode plate.

4,477,540
METAL-GAS CELL WITH ELECTROLYTE RESERVOIR

Lee E. Miller, Carl Junction, and Dennis D. Carr, Jasper, both of Mo., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Oct. 3, 1983, Ser. No. 538,088
Int. Cl.³ H01M *4/00*
U.S. Cl. 429—27 **8 Claims**



1. An electrochemical cell including a plurality of positive and negative plates arranged as a plate stack within a cell casing, said plates being saturated with a liquid electrolyte, wherein in cycling use, said plates tend to increase in volume;

said cell further comprising a compressible electrolyte containing reservoir positioned within said casing relative to said plate stack such that an increase in volume of said plate stack compresses said reservoir and forces electrolyte from said reservoir through passage means to distribute electrolyte into said plate stack.

4,477,541
SOLID ELECTROLYTE STRUCTURE

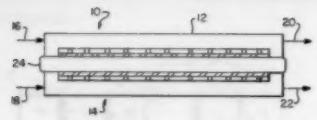
Anthony V. Fraioli, Hawthorn Woods, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 22, 1982, Ser. No. 452,361
Int. Cl.³ H01M *8/10*
U.S. Cl. 429—33 **14 Claims**

1. An electrochemical device comprising electrode means and as a solid electrolyte structure, a porous elongated layer having a pair of laterally opposite surfaces and internally composed predominantly of a multiplicity of small, open pores sized below about 1×10^4 Å, the pores forming a plurality of ion-transfer passages extending laterally between the opposite surfaces for transferring oxygen-ions laterally within the layer,

the layer having an electronic insulating composition around said pores composed of a metallic oxide with the formula

$T_aX_bO_c$



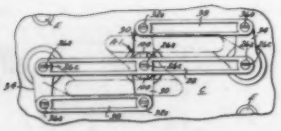
wherein T is a transition metal, X is at least one metal selected from the group consisting of a transition metal, Al, Sn, and an alkali metal, and the integers a, b and c represent the number of atoms to balance the formula, said layer having a density of about 2–5 gm/cc, being essentially gas-tight and stable at temperatures above about 200° C.

4,477,542

QUICK RELEASE STORAGE BATTERY CLOSURE ASSEMBLY

Richard R. Braswell, 3154 Studebaker Rd., Long Beach, Calif. 90808

Filed Dec. 12, 1983, Ser. No. 560,374
Int. Cl.³ H01M *2/12*
U.S. Cl. 429—87 **10 Claims**



1. In combination with a storage battery having a plurality of longitudinally spaced, upwardly extending cylindrical bosses that have upper edge surfaces and define a plurality of inspection openings, each of said bosses including a pair of lugs that extend inwardly towards one another and have a pair of circumferential spaces therebetween, a quick release closure assembly for said inspection openings said quick release closure assembly including:

a. a plurality of generally cylindrical bodies, each of said bodies having an upper portion and a lower portion that at their junction define a flat ring shaped body shoulder, a pair of diametrically opposed cam members that extend outwardly from said lower portion and of such length as to be capable of being moved downwardly through said pair of circumferential spaces when said body is in a first position in one of said inspection openings, said pair of cam members having oppositely extending inclined upper edge surfaces;

b. first means for maintaining said generally cylindrical bodies in such longitudinal spacing that said cylindrical bodies may be moved concurrently into or out of said inspection openings when said cylindrical bodies occupy said first position;

c. a plurality of resilient washers that encircle said lower portions of said cylindrical bodies and abut against said body shoulders; and

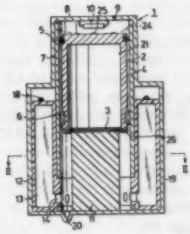
d. second means for concurrently rotating said generally cylindrical bodies to second positions from said first positions when said lower portions are in said inspection opening and said cam members at least partially below said lugs, with said inclined upper edge surfaces slidably engaging said lugs to removably interlock therewith and compress said washers to effect seals between said body shoulders and said upper edge surfaces of said bosses.

4,477,543

ACTIVATEABLE BATTERY

Jan M. V. Björklund, Järfälla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,325
Claims priority, application Sweden, Dec. 30, 1982, 8207499
Int. Cl.³ H01M *6/36*
U.S. Cl. 429—115 **9 Claims**



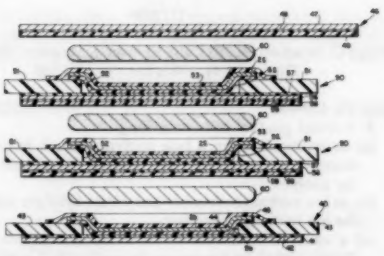
1. An activateable battery comprising a sleeve, a container of electrolyte having a bottom provided with a membrane and being arranged within the sleeve, and one or more cells arranged in connection with the sleeve, characterized in that the container of electrolyte in a non-activated state is arranged in an upper end position above a tap situated in the lower region of the sleeve, which tap is adapted to the inner volume of the container of electrolyte, and that the container of electrolyte when actived is pressed down over the tap, the electrolyte being pressed out of the container of electrolyte and via cell openings into the cells when the container of electrolyte is moved down over the tap, and the container of electrolyte occupying a lower position after its moving down over the tap said container in its lower end position closes the cell openings.

4,477,544

INTERCELL CONNECTOR FOR LITHIUM BATTERIES

Alan H. Bruder, Burlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 341,196, Jan. 20, 1982, Pat. No. 4,429,026.
This application Oct. 6, 1983, Ser. No. 539,644
Int. Cl.³ H01M *2/20*
U.S. Cl. 429—160 **1 Claim**



1. An intercell assembly for lithium batteries, comprising an electrically insulating frame of thermoplastic material formed with a cental aperture, a thin sheet of aluminum foil coated on both sides with a conductive plastic adhesive and adhered on a rirst side to a first side of said frame in regions surrounding said aperture, a first layer of conductive plastic adhered to said

aluminum foil on a second side opposite said first side, a second layer of conductive plastic adhered to said frame on a second side opposite said first side in regions surrounding said aperture and adhered to said aluminum foil in regions within said aperture, and a thin sheet of metallic lithium adhered to said second layer of conductive plastic on a side thereof opposite said aluminum foil.

4,477,545

ISOSTATIC COMPRESSION METHOD FOR PRODUCING SOLID STATE ELECTROCHEMICAL CELLS

James R. Akridge, Parma, and Harry Vourlis, Lakewood, both of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 29, 1983, Ser. No. 509,133
Int. Cl.³ H01M *6/18*
U.S. Cl. 429—191 **8 Claims**

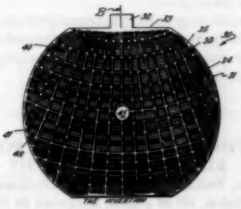
1. A method for manufacturing solid state electrochemical cells comprising isostatically compressing at least one cell preassembly which preassembly comprises a malleable metal anode selected from the group consisting of alkali metals, alkaline earth metals, aluminum, copper, silver, lead, and alloys and mixtures thereof at a pressure of between about 10,000 and about 100,000 pounds per square inch.

4,477,546

LATTICE FOR A BATTERY ELECTRODE SUBSTRATE

James R. Wheeler; Jack N. Brill, both of Joplin, and Lee E. Miller, Carl Junction, all of Mo., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Feb. 3, 1983, Ser. No. 463,632
Int. Cl.³ H01M *4/73*
U.S. Cl. 429—211 **8 Claims**



1. In a substrate for a battery electrode, said substrate being in the form of a reticulated lattice bordered by a perimeter and having a current conducting tab on a portion of said perimeter, the improvement wherein said lattice comprises;

first current carrying portions within the perimeter which are angulated to one another and which converge in straight lines toward an imaginary point outside the perimeter of the substrate, and

second current carrying portioas within the perimeter and intersecting the first current carrying portions and extending generally perpendicularly thereto at the points of intersection,

the lattice thus formed by the first and second portions defining therein generally rectangular sections which are of substantially equal area.

4,477,547

METHOD FOR MAKING COMPLEX LAYER TYPE LITHOGRAFIC PRINTING PLATE

Jun Yamada; Takao Senga, and Shigeyoshi Suzuki, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jan. 6, 1983, Ser. No. 455,998
Claims priority, application Japan, Jan. 7, 1982, 57-1322
Int. Cl.³ G03C *3/00*; G03G *13/28*
U.S. Cl. 430—14 **8 Claims**

1. A method for making a complex layer type lithographic printing plate which comprises forming a toner image on an original printing plate having organic electrophotographic photosensitive layer by electrophotographic process, said photosensitive layer being a complex layer type photosensitive layer which comprises a charge carrier generating layer comprising a charge carrier generating substance and a binder mainly composed of a polyamide resin soluble in alcohol solvent and a high molecular substance having compatibility with said polyamide resin and having a group soluble in an etching solution mainly composed of alcohol solvent and/or an alkali solvent to accelerate dissolution in said etching solution and a charge carrier transport layer comprising a charge carrier transport substance and a high molecular substance having a group soluble in an etching solution mainly composed of alcohol solvent and/or alkali solvent and thereafter treating non-image area other than the toner image area with the etching solution.

4,477,548

RADIATION-CURABLE OVERCOAT COMPOSITIONS AND TONER-IMAGED ELEMENTS CONTAINING SAME

Louis P. Harasta, Rochester; Gerald M. Leszyk, Spencerport, and Edward D. Morrison, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

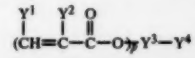
Continuation of Ser. No. 414,128, Sep. 2, 1982, abandoned. This application Dec. 16, 1983, Ser. No. 562,043
Int. Cl.³ G03G *5/14, 13/20*
U.S. Cl. 430—14 **34 Claims**

1. An element bearing an electrographically formed image, said element comprising:

(A) a substrate bearing an electrographically-formed toner image of toner particles, and

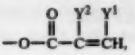
(B) an abrasion- and scratch-resistant, crosslinked polymeric overcoat layer bonded to said toner image-bearing substrate, said overcoat layer having been formed by:

(1) coating said toner image-bearing sustrate with a curable coating composition consisting essentially of (a) either (i) a mixture of a siloxy-containing polycarbinol and an acrylated urethane or (ii) a siloxy-containing acrylated urethane, and (b) a multifunctional acrylate of the formula:

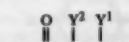


wherein p is an integer from 1 to 3; Y^1 and Y^2 are independently hydrogen, halo or alkyl; Y^3 is a polyvalent aliphatic, alicyclic or aromatic group; and Y^4 is

hydrogen or



provided that when p is 1, Y^4 is



and

(2) curing said coating to bond it to said toner image-bearing substrate.

4,477,549

PHOTORECEPTOR FOR ELECTROPHOTOGRAPHY, METHOD OF FORMING AN ELECTROSTATIC LATENT IMAGE, AND ELECTROPHOTOGRAPHIC PROCESS

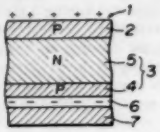
Yoshihide Fujimaki; Yoshiaki Takei, and Hiroyuki Nomori, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Sep. 24, 1982, Ser. No. 422,728

Claims priority, application Japan, Sep. 28, 1981, 56-151976; Sep. 28, 1981, 56-151978

Int. Cl.³ G03G 13/24

U.S. Cl. 430—54 **22 Claims**



1. A method of forming a latent electrostatic image including a step of forming a uniform charge layer on the surface of a photoreceptor comprising a conductive support having successively formed thereon a photoconductive photosensitive layer and a photoconductive protective layer, said photosensitive layer being capable of absorbing at least light in a wavelength range other than that for said protective layer, a step of imagewise exposure to light that is absorbed by said photosensitive layer but not substantially absorbed by said protective layer, and a step of full-frame exposure to light that is absorbed by said protective layer but not substantially absorbed by said photosensitive layer.

4,477,550

ELECTROPHOTOGRAPHIC PHOTORECEPTOR WITH HYDRAZONE

Seiji Horie; Masayoshi Nagata; Junji Nakano, and Hideo Sato, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 276,745, Jun. 24, 1981, Pat. No. 4,403,025. This application May 4, 1983, Ser. No. 491,482

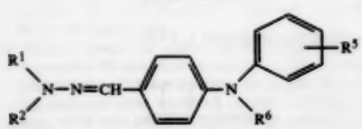
Claims priority, application Japan, Jun. 24, 1980, 55-85495

Int. Cl.³ G03G 5/06

U.S. Cl. 430—59 **10 Claims**

1. An electrophotographic photoreceptor comprising a conductive support with a light-sensitive layer thereon containing a hydrazone compound represented by formula (III):

(II)



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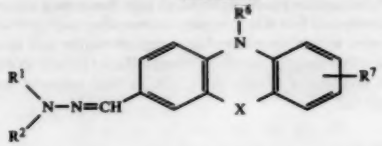
(III)



wherein X represents O, S or >N—R^6; R^1 and R^2 each represents a non-substituted or a substituted straight or branched chain alkyl group containing from 1 to 12 carbon atoms, a non-substituted or a substituted straight or branched chain aralkyl group containing from 7 to 20 carbon atoms, or a non-substituted or a substituted aryl group, the aryl group including monovalent residues of monocyclic aromatic rings and condensed polycyclic aromatic rings having from 2 to 4 rings therein; R^7 represents hydrogen, a non-substituted or a substituted straight or branched chain alkyl group containing from 1 to 12 carbon atoms, a non-substituted or a substituted straight or branched chain aralkyl group containing from 7 to 20 carbon atoms, a straight or a branched chain alkoxy group containing from 1 to 4 carbon atoms, an aryloxy group containing from 6 to 10 carbon atoms, an acyl group containing from 2 to 8 carbon atoms, an alkoxycarbonyl group containing from 2 to 5 carbon atoms, a halogen atom, a nitro group, a monoalkylamino group whose alkyl moiety contains from 1 to 4 carbon atoms, a dialkylamino group whose alkyl moiety contains from 1 to 4 carbon atoms, or an amido group containing from 2 to 8 carbon atoms; and R^6 represents a non-substituted or a substituted straight or branched chain alkyl group containing from 1 to 12 carbon atoms, or a non-substituted or a substituted straight or branched chain aralkyl group containing from 1 to 12 carbon atoms.

2. An electrophotographic photoreceptor as in claim 1, wherein at least one of the groups represented by R^1 R^2, R^6 and R^7 has a substituent group, and the substituent group is selected from a halogen atom, an alkoxy group, an aryloxy group, a dialkylamino group, and an alkylthio group.

3. An electrophotographic photoreceptor as in claim 1, wherein at least one of the groups represented by R^1 R^2, R^6 and R^7 is an aryl group which has a substituent group, and the substituent group is selected from a halogen atom, an alkoxy group, an aryloxy group, a dialkylamino group, an alkylthio group, and an alkyl group.

5. An electrophotographic photoreceptor as in claim 1, 2, or 3, wherein said light-sensitive layer is formed of (1) a charge transport layer containing said hydrazone compound and (2) a charge generating layer.

4,477,551

PHOTOSENSITIVE LAYER FOR ELECTROPHOTOGRAPHY

Akira Fushida, Suita; Yoshiaki Kato, Hirakata, and Yasushi Kamezaki, Sakai, all of Japan, assignors to MHA Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 252,161, Apr. 8, 1981, abandoned. This application May 23, 1983, Ser. No. 495,925

Claims priority, application Japan, Apr. 10, 1980, 55-46268

The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.

Int. Cl.³ G03G 5/07

U.S. Cl. 430—133 **12 Claims**

1. A process for the production of a photosensitive plate for electrophotography which comprises forming a coating composition comprising (a) polyvinyl carbazole and (b) 0.05 to 3 parts by weight, per part by weight of polyvinyl carbazole, of a fused polycyclic aromatic hydrocarbon selected from the group consisting of phenanthrene, acenaphthylene and pyrene dissolved in an organic solvent and further comprising (c) a photoconductive organic pigment dispersed therein, coating the composition on the surface of a conductive substrate and

drying the coated composition to form a photosensitive layer having a thickness of 1 to 100 microns.

4,477,552

STABILIZATION OF DIAZO-RESIN SENSITIZERS WITH POLYVINYL PYRIDINE

Peter M. G. Day; John W. Jones, both of Wantage, and John A. Sperry, Abingdon, all of England, assignors to Autotype International Limited, Wantage, England

Filed Oct. 28, 1982, Ser. No. 437,195

Claims priority, application United Kingdom, Jan. 12, 1982, 8200746

Int. Cl.³ G03C *1/60*; G03F *7/08, 7/12*

U.S. Cl. 430—175 **12 Claims**

1. In a light-sensitive film-forming composition comprising in admixture an aqueous dispersion of a water-soluble or water-dispersible colloid selected from the group consisting of polyvinyl alcohol, gelatin, casein, hydroxyethylcellulose, polyacrylamide, polyvinylpyrrolidone, poly(vinyl-acetate), and copolymer of vinyl-acetate with ethylene present in a film-forming amount, and a water-soluble light-sensitive diazo-resin condensation product of an aromatic diazonium compound and a compound containing an active carbonyl group, present in an amount effective to decrease the solubility of the film upon exposure to light; the improvement in which the composition contains, as a stabilizer for the diazo-resin condensation product, a linear polymer of vinyl-pyridine in an amount effective to delay deterioration of said product in the presence of water.

4,477,553

PHOTOSENSITIVE COMPOSITIONS

Takeshi Yamamoto; Kiyoshi Goto, and Masafumi Uehara, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

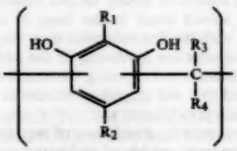
Continuation of Ser. No. 329,035, Dec. 9, 1981, abandoned. This application Dec. 29, 1983, Ser. No. 566,778

Claims priority, application Japan, Dec. 17, 1980, 55-178618; Dec. 17, 1980, 55-178619

Int. Cl.³ G03C *1/60, 1/54*; G03F *7/08*

U.S. Cl. 430—192 **22 Claims**

1. A photosensitive composition comprising an admixture of an o-quinonediazide compound and a binder resin having units of the formula



wherein R_1 is selected from a hydrogen atom, a hydroxyl group and an alkyl group having 1 to 8 carbon atoms; R_2 is selected from a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms and an alkoxy group having 1 to 4 carbon atoms; R_3 is selected from a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an aryl group and a substituted aryl group; and when R_1 is selected from a hydrogen atom or a hydroxyl group, then R_4 is selected from a phenyl group and a phenyl group substituted with a halogen atom, an alkyl group, an alkoxy group and a nitro group; and when R_1 is an alkyl group having 1 to 8 carbon atoms then R_4 is selected from a hydrogen atom, a lower alkyl group having 1 to 4 carbon atoms, an aryl group and a substituted aryl group, the amount of said o-quinonediazide compound being between 10 and 50% by weight and the amount of said binder resin being between 1 and 80% by weight based on the total solid content of said photosensitive composition.

4,477,554

DIFFUSION TRANSFER MATERIAL AND PROCESS

Christian C. Van de Sande, Belsele, and André Verbecken, Mortsel, both of, Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

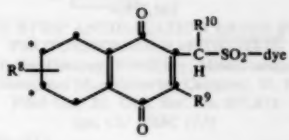
Filed Oct. 26, 1983, Ser. No. 545,434

Claims priority, application United Kingdom, Nov. 12, 1982, 8232448

Int. Cl.³ G03C *1/40, 7/00, 5/54*

U.S. Cl. 430—223 **5 Claims**

1. A photographic silver halide material comprising a support carrying at least one alkali-permeable silver halide hydrophilic colloid emulsion layer which contains therein a quinonoid compound which is immobile in an alkali-permeable colloid medium when permeating said medium with an alkaline aqueous liquid and which contains a dye moiety and a ballasting group, wherein said compound is capable of being reduced by a silver halide developing agent at a rate slower than that of image-wise developable silver halide in the photographic material and in reduced state is capable of releasing said dye moiety under alkaline conditions, characterized in that said quinonoid compound corresponds to the following general formula:



wherein:

R^8 is hydrogen or methyl in the 6- or 7-position (indicated by an asterisk) on the saturated adjacent ring part of the quinonoid nucleus,

R^9 is an alkyl group or an aromatic group,

R^{10} is hydrogen, an alkyl group or an aryl group, and at least one of the substituents R^9 and R^{10} represents or includes a ballasting group of sufficient size to render said compound immobile in an alkali-permeable hydrophilic colloid layer when such layer is permeated with an aqueous alkaline liquid.

4. A photographic material according to claim 1, comprising one or more negative working photosensitive silver halide emulsion layers, a supported receptor layer, and an alkali-permeable light-reflective opaque layer between said emulsion layer(s) and said supported receptor layer.

4,477,555

OPTICAL INFORMATION RECORDING MEDIUM

Hideaki Oba, Yokohama; Makoto Kunikane, Chigasaki; Masaakira Umehara, Yokohama; Kiyoshi Tanikawa, Yokohama, and Michiharu Abe, Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,694

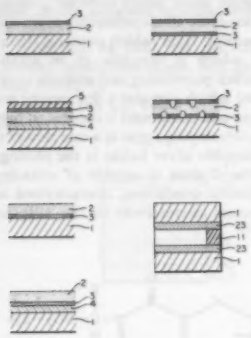
Claims priority, application Japan, Aug. 1, 1981, 56-120935; Aug. 1, 1981, 56-120936; Aug. 1, 1981, 56-120937; Sep. 8, 1981, 56-140280

Int. Cl.³ G03C *1/76*

U.S. Cl. 430—273 **13 Claims**

1. An optical information recording medium comprising a substrate and a recording layer superimposed on said substrate, said recording layer consisting of a reflective sub-layer and a light absorptive sub-layer formed on said reflective sub-layer, said reflective sub-layer containing closely distributed therein

metal particles having a particle diameter of 1500 Angstroms or less and wherein said metal particles occupy from 60 to 98% of the area of the surface of said reflective sub-layer, said light absorptive sub-layer being made of a resin containing particles of metal compound and a very small amount of metal substantially uniformly dispersed therein, said particles of metal compound and metal in said light absorptive sub-layer having a particle size in the range of from 200 to 2000 Angstroms, the sum of the amounts of said particles of metal compound and metal in said light absorptive sub-layer being in the range of from 1 to 30 volume %, based on the volume of said light absorptive sub-layer.



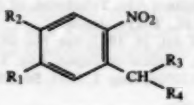
4,477,556

ACIDIC O-NITROAROMATICS AS PHOTOINHIBITORS OF POLYMERIZATION IN POSITIVE WORKING FILMS

Thomas E. Dueber, and William J. Nebe, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 18, 1982, Ser. No. 409,096
Int. Cl.³ G03C 2/68, 5/00; C07C 79/46
U.S. Cl. 430—281 11 Claims

1. An acidic o-nitroaromatic compound of the formula



wherein at least on of R_1, R_2, R_3 or R_4 must have a carboxyl group as indicated below;

R_1, R_2, alike or different, are selected from alkoxy in which the alkyl is of 1 to 12 carbons, and $-(CH_2)\times CO_2H$ where x=1 to 12;

R_1 and R_2, taken together, are $—OCH_2O—$,

R_3 is selected from H, lower alkyl, OH, and alkoxy in which the alkyl portion is of 1 to 6 carbons;

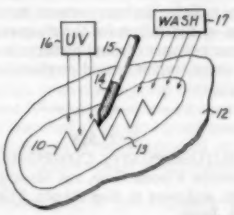
R_4 is aryloxy of 6 carbons substituted with carboxyl, or $-(CH_2)\times CO_2H$ where x=2 to 12, and x≠2 or 3 when R_3 is OH.

4,477,557

STENCIL MAKING AND UTILIZATION METHODS, APPARATUS AND ARTICLES

Georg Rauch, Apartado #33, Jocotepec, Jalisco, Mexico

Filed Nov. 25, 1981, Ser. No. 324,733
Int. Cl.³ G03F 7/12
U.S. Cl. 430—308 15 Claims



1. In a method of making a stencil of a desired design with the aid of first and second individually soluble substances being hardenable in admixture, the improvement comprising in combination the steps of:

providing a foraminous stencil blank;

impregnating said foraminous stencil blank with the first substance;

storing the second substance separately from said impregnated stencil blank;

applying the separately stored second substance to the impregnated stencil blank in the form of said design for admixture with the first substance only immediately prior to a desired selective hardening of the admixed first and second substances and exposing the stencil to hardening of the admixed first and second substances as to render part of the stencil imperforate; and

exposing the stencil to dissolution of any applied first and second substances outside of said part so as to render the stencil perforate outside of said part.

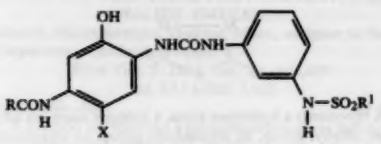
4,477,558

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Akira Ogawa; Kozo Aoki, and Takayoshi Kamio, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 21, 1983, Ser. No. 487,494
Claims priority, application Japan, Apr. 28, 1982, 57-72202
Int. Cl.³ G03C 7/16
U.S. Cl. 430—384 18 Claims

15. A method of forming a color image comprising developing an imagewise exposed silver halide color photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer and a cyan dye forming coupler represented by the following general formula (I):



(I)

wherein R represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted heterocyclic group; X represents a hydrogen atom or a group capable of being released upon an oxidative coupling reaction with a developing agent; and R^1 represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted heterocyclic group; with an alkaline aqueous developing solution containing a primary aromatic amine developing agent.

4,477,559

PHOTOSENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Masao Iwamuro, Hachioji, and Kenji Kumashiro, Hino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1983, Ser. No. 468,399
Claims priority, application Japan, Feb. 25, 1982, 57-30392
Int. Cl.³ G03C *1/46*
U.S. Cl. 430—505 **8 Claims**

1. A photosensitive silver halide color photographic material comprising a support having a first and second surface, said first surface having thereon an anti-halation layer, a red-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer and a blue-sensitive silver halide emulsion layer, each of said silver halide emulsion layers containing a non-diffusible coupler, said second surface of the support having thereon a dye-containing backing layer, wherein said anti-halation layer contains between 0.18 and 0.2 g/m² of silver and wherein the total amount of silver contained in said silver halide emulsion layers is at least 7.0 g/m².

4,477,560

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Takeo Koitahashi; Kiyoshi Yamashita, and Toshifumi Iijima, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,371
Claims priority, application Japan, Dec. 16, 1981, 56-203175
Int. Cl.³ G03C *1/46*
U.S. Cl. 430—506 **10 Claims**

1. A light-sensitive silver halide color photographic material, comprising a color sensitive layer containing a plurality of silver halide emulsion layers, said plurality of emulsion layers consisting of at least two silver halide emulsion layers having different sensitivities to light, the layer having the highest sensitivity containing at least one compound having a non-diffusion type coupler component and a scavenger component for reaction with an oxidized product of a color forming developing agent, the amount of said compound being 1 to 5 mole % per mole of the silver halide in the layer of highest sensitivity containing said compound.

4,477,561

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hiroshi Menjo, Hachioji; Yoshikazu Watanabe, Akishima, and Nobuo Sakamoto, Isukui, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1983, Ser. No. 467,365
Claims priority, application Japan, Feb. 19, 1982, 57-26381
Int. Cl.³ G03C *1/08*
U.S. Cl. 430—509 **3 Claims**

1. A silver halide photographic material having a wide latitude for exposure which will not vary greatly with time during storage, said material having formed on a support two or more layers that are sensitive to the lights of substantially the same spectral region but different in light sensitivity, wherein at least one of the layers other than the layer having maximum light sensitivity contains at least 40 mg, per 100 g of silver, of a water-soluble compound containing an element of Group VIII of the periodic table which has a molecular weight of 100 or more and the layer having maximum light sensitivity contains a water-soluble compound containing an element of Group VIII of the periodic table with a molecular weight of 100 or more in an amount that does not exceed 40 mg per 100 g of silver.

4,477,562

DRY STRIP ANTIHALATION LAYER FOR PHOTOTHERMOGRAPHIC FILM

Jeanine I. Zeller-Pendrey, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 24, 1983, Ser. No. 497,573
Int. Cl.³ G03C *1/78*
U.S. Cl. 430—513 **12 Claims**

1. A photothermographic element comprising
a. at least one photosensitive layer, capable of being developed by heat after image-wise exposure to radiation in the range of 380 to 800 nm, adhered to one surface of a transparent polymeric support base, and
b. a unitary antihalation layer having a resistance greater than 5000 ohms per square, adhered to any surface of said element and dry-strippable therefrom, said antihalation layer having a delaminating resistance in the range of 6 to 50 g/cm, a layer strength in g/cm greater than its delaminating resistance, and an optical density of at least 0.1.

4,477,563

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Seiji Ichijima; Kei Sakanoue; Hidetoshi Kobayashi, and Keiichi Adachi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

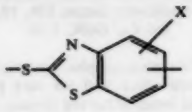
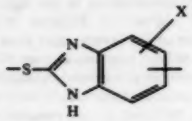
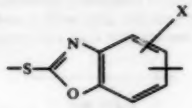
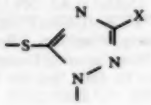
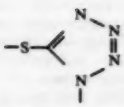
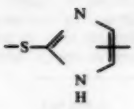
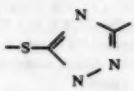
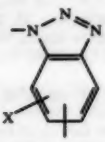
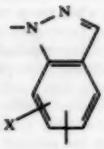
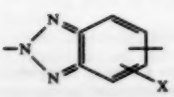
Continuation-in-part of Ser. No. 358,723, Mar. 16, 1982, abandoned. This application Aug. 25, 1983, Ser. No. 526,314
Claims priority, application Japan, Mar. 16, 1981, 56-37374
Int. Cl.³ G03C *7/26*
U.S. Cl. 430—544 **22 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer containing a coupler having, at the coupling active position, a group which provides a compound having a development inhibiting property when the group is released from the coupling active position of the coupler upon the color development reaction and which is decomposed to a compound which does not substantially influence the photographic properties when the compound diffuses into a color developing solution, the coupler containing no water-soluble group during development but becoming water-soluble when dissolved in a developer and hydrolyzed and the coupler being represented by general formula (I)

$$A—(L_1)_a—Z—L_2—Y)_b \quad (I)$$

wherein A represents a coupler component; Z represents an essential portion of a compound having a development inhibit-

ing function which is bonded to the coupling position of the coupler directly (when a is 0) or through a connecting group of the formula L_1 (when a is 1), the portion being represented by any one of the formulae

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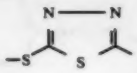
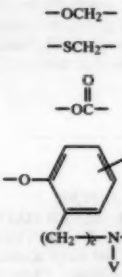
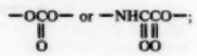


where X represents a hydrogen atom, a halogen atom, an alkyl group, an alkenyl group, an alkanamido group, an alkenamido group, an alkoxy group, a sulfonamido group, or an aryl group; Y represents a substituted straight chain or substituted branch chain alkyl group, a cyclic alkyl group which is unsubstituted or substituted, an alkenyl group, an aryl group, an aralkyl group or a heterocyclic group; L_1 represents



where V represents a hydrogen atom or an alkyl group having 1 to 10 carbon atoms, W represents a hydrogen atom, a halogen atom, an alkyl group having from 1 to 10 carbon atoms, an alkanamido group having from 1 to 10 carbon atoms, an alkoxy group having from 1 to 10 carbon atoms, an alkoxycarbonyl group having from 1 to 10 carbon atoms, an aryloxycarbonyl group, an alkanesulfonamido group having from 1 to 10 carbon atoms, an aryl group, a carbamoyl group, an N-alkylcarbamoyl group having from 1 to 10 carbon atoms, a nitro group, a cyano group, an arylsulfonamido group, a sulfamoyl group, or an imido group, and c is 0 or an integer of 1 or 2; L_2 is a divalent connecting group containing a chemical bond which is broken in a photographic developing solution, the chemical bond being represented by the formula

$-COO-$, $-NHCOO-$, $-SO_2O-$, $-OCH_2CH_2SO_2-$,



a represents 0 or 1; and b represents 1 or 2, and when b is 2, the groups represented by $-L_2-Y$ may be the same or different.

4,477,564

PHOTOGRAPHIC SILVER HALIDE EMULSIONS, PROCESS FOR PREPARING THE SAME AND THEIR USE IN COLOR REVERSAL FILMS

Luigi Cellone, and Marco Loiacono, both of Albissola Mare, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 1, 1982, Ser. No. 364,206

Int. Cl.[3] **G03C** *1/02, 1/46, 7/26*

U.S. Cl. 430—567 **19 Claims**

1. High-sensitivity photographic emulsion consisting of silver iodo-bromide grains having at least 12% nominal iodide mole percent dispersed in gelatin characterized by having said grains including at least three different iodo-bromide phases having different iodide contents, the most external phase having an iodide content lower than the nominal iodide content.

4,477,565

METHOD FOR PREPARING PHOTOSENSITIVE SILVER HALIDE EMULSION

Richard S. Himmelwright, Melrose, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 2, 1983, Ser. No. 462,804
Int. Cl.³ G03C 1/02
U.S. Cl. 430—567 17 Claims

1. A method for forming a photosensitive silver halide emulsion wherein the grains are predominantly tabular grains which are multiply twinned on the (111) plane and possess a mean aspect ratio of at least 10 which comprises inducing twinning in feedstock silver bromide grains and then growing said grains in a silver halide solvent solution for a time sufficient to provide said tabular grains and substantially all of said feedstock grains have disappeared.

10. A method for forming a photosensitive silver halide emulsion wherein the grains are predominantly tabular grains which are multiply twinned on the (111) plane and possess a mean aspect ratio of at least 10 which comprises the following steps, in sequence,

(a) precipitating feedstock silver bromide grains at a pAg of not greater than about 9.7;

(b) adjusting the pAg to between about 9.8 and 11.8 to induce twinning on the (111) crystal plane in said grains; and

(c) growing said grains in a solution of a silver halide solvent for a time sufficient to provide said tabular grains and substantially all of said feedstock grains have disappeared.

4,477,566

METHOD FOR DETERMINATION OF CYTOPLASMATIC AND MITOCHONDRIAL ISOENZYMES OF GLUTAMIC-OXALACETIC TRANSAMINASE IN HUMAN SERUM OR PLASMA

Giorgio Ricci, and Giorgio Federici, both of Rome, Italy, assignors to Biodata S.p.A., Italy

Filed May 25, 1982, Ser. No. 381,777
Claims priority, application Italy, May 28, 1981, 48565 A/81
Int. Cl.³ C12Q 1/52, 1/32; C12N 9/99
U.S. Cl. 435—16 5 Claims

1. Method for determination of single enzymatic activities of the cytoplasmatic and mitochondrial isoenzymes of Glutamic Oxalacitic Transaminase (GOT) in samples of serum or plasma, comprising the steps of determining the GOT activity present in serum or plasma before and after cytoplasmatic isoenzyme deactivating incubation with L-serin-O-sulphate to obtain in the first case an enzymatic activity value corresponding to the total sum of activity of the two isoenzymes, and in the second case a value of enzymatic activity corresponding to the activity of only the mitochondrial enzyme, the activity of cytoplasmatic isoenzyme being obtained from the difference of the two above mentioned values.

4,477,567

CONTINUOUS BOVINE BETA CELL LINE

George M. Healy, Downsview; Anthony M. Sun, Willowdale, and Hilda G. Macmorine, Thornhill, all of Canada, assignors to Connaught Laboratories Limited, Willowdale, Canada

Filed Dec. 1, 1977, Ser. No. 856,284
Int. Cl.³ C12P 21/04; C12N 5/00
U.S. Cl. 435—71 4 Claims

1. A process for the production of insulin, which comprises:

cultivating a continuous beta cell line as deposited with the American Type Culture Collection under accession number ATCC CRL 1407 in a nutrient culture medium for a time sufficient to form insulin in cells of the cell line,

said cell line being characterized by transformed cells which:

(1) have a morphology very similar to that of beta cells of the bovine pancreas,

(2) have the diploid number of chromosomes for the bovine species,

(3) have a generation time of not more than 24 hours,

(4) are capable of producing insulin within the cells, and

(5) do not secrete said produced insulin to the culture medium; and

extracting insulin from cells of said cell line.

4,477,568

PROCESS FOR THE MANUFACTURE OF CYCLODEXTRIN

Hendrik Hokse, Tynaarlo; Frederik S. Kaper, Blijham, and Jacob T. Wijpkema, Siddeburen, all of Netherlands, assignors to Proefstation voor Aardappelverwerking-TNO en Cooperatieve Verkoopen Produktievereniging van Aardappelmeel en Derivaten AVERE B.A., Groningen, Netherlands

Filed Sep. 20, 1982, Ser. No. 419,800
Claims priority, application Netherlands, Sep. 24, 1981, 8104410
Int. Cl.³ C12P 19/18; C12N 9/18
U.S. Cl. 435—97 4 Claims

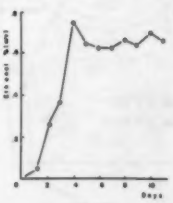
1. A process for producing cyclodextrin from starch in which an aqueous solution comprising starch is subjected to the action of the active enzyme, cyclodextrin glycosyltransferase obtained by cultivation of *Bacillus circulans* RIV nr.11115, and the resulting reaction product comprising cyclodextrin, starch degradation products and the active enzyme is subjected to an ultrafiltration process to effect passage of the formed cyclodextrin through the membrane employed in said process, while retaining substantially all of the other starch degradation products and active enzyme, thus permitting more cyclodextrin to be formed in the retentate, which will then pass said membrane; and collecting the aqueous solution including said cyclodextrin.

4,477,569

PENTOSE FERMENTATION WITH SELECTED YEAST

Henry Schneider, Nepean; Ryszard Maleszka, Ottawa, both of Canada; Patrick Y. Wang, Hong Kong, Hong Kong; Ivan A. Veliky, and Yui-Kwok Chan, both of Ottawa, Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Feb. 18, 1982, Ser. No. 349,905
Int. Cl.³ C12P 7/06; C12N 1/16; C12R 1/645
U.S. Cl. 435—161 10 Claims



1. A method of producing ethanol directly from a substrate comprising D-galactose and D-xylose, which comprises:

(a) screening and selecting *Pachysolen tannophilus* having the identifying characteristics of NRCC-PTXG-1 or mutants thereof which can ferment at least said two sugars to ethanol, concurrently,

(b) inoculating a growth-supporting medium containing said substrate with the selected mutant,

(c) providing access of air or oxygen to the medium at least for an initial stage,

(d) allowing growth and accumulation of ethanol to occur,

(e) separating the medium from the yeast cells and recovering ethanol, and

(f) recycling the yeast cells to ferment fresh medium in (b).

4,477,570
MICROBIAL DEGRADATION OF OBNOXIOUS ORGANIC WASTES INTO INNOCUCOUS MATERIALS

Joseph F. Colaruotolo, Grand Island, N.Y.; Ronald H. Olsen, Ann Arbor, Mich., and Peter A. Vandenbergh, Sarasota, Fla., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Sep. 24, 1981, Ser. No. 305,079
Int. Cl.³ C12N *1/20, 1/00, 15/00*
U.S. Cl. 435—253 **15 Claims**

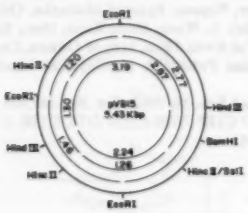
1. A biologically pure culture of *Pseudomonas cepacia* var., niagarous selected from the group consisting of ATCC 31945, ATCC 31941, ATCC 31942, ATCC 31940, ATCC 31943, ATCC 31944, ATCC 31939 and mutants thereof useful in decomposing obnoxious halogenated organic wastes to innocuous materials.

11. A biologically pure hybrid plasmid consisting essentially of pRO 4.7 (having a molecular weight of approximately 4.7 megadaltons), pRO 31 (having a molecular weight of approximately 31 megadaltons), and pRO 54 (having a molecular weight of approximately 54 megadaltons), said pure hybrid plasmid having the further identifying characteristic of being capable of replicating the ability to express the degradation of halogenated organic compounds.

4,477,571
CHIMERIC PLASMIDS THAT REPLICATE IN BACTERIA AND YEAST AND MICROORGANISMS TRANSFORMED THEREWITH

Shing Chang, Hercules, and James H. Meade, Pinole, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 232,435, Feb. 9, 1981, abandoned. This application Feb. 5, 1982, Ser. No. 346,258
Int. Cl.³ C12N *1/20, 15/00, 1/18, 1/00*
U.S. Cl. 435—253 **6 Claims**



1. Chimeric plasmid pVB5.
2. Chimeric plasmid pVB15.

4,477,572
REMOTE MONITORING OF ESTER FUNCTIONAL FLUIDS

Joseph F. Anzenberger, Sr., New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

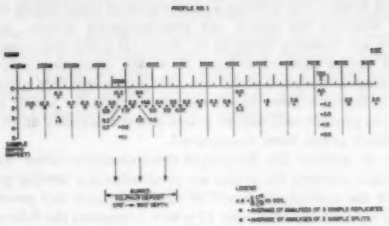
Filed May 28, 1982, Ser. No. 383,361
Int. Cl.³ G01N *27/02, 27/04*
U.S. Cl. 436—6 **11 Claims**

1. A method of remotely monitoring the degradation of hydrolyzable ester containing functional fluid which comprises placing in said fluid at least one probe containing at least one corrodible metal sensor, said metal sensor having a standard electrode potential of less than −0.13 volts, and measuring by electrical means the corrosion of said metal sensor in said fluid.

4,477,573
SULPHUR GAS GEOCHEMICAL PROSPECTING

Paul M. Taufen, Golden, Colo., assignor to Texasgulf, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 265,644, May 20, 1981, Pat. No. 4,377,640. This application May 28, 1982, Ser. No. 383,028
Int. Cl.³ G01N *33/24, 23/00*
U.S. Cl. 436—33 **7 Claims**

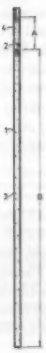


1. A method of geochemical prospecting for buried sulphur mineralization which comprises:
(a) collecting at least one soil sample from a depth beneath the zone of high plant and organic matter contribution to the composite soil;
(b) generating carbon dioxide gas from the carbon in the carbonate fraction of said soil sample; and,
(c) analysing the proportion of carbonate carbon-12 and carbonate carbon-13 in said carbon dioxide gas to determine the presence of buried sulphur mineralization.

4,477,574
METHOD OF TIME-MARKING SEDIMENTATION PROCESSES

Torsten G. Silander, Stockholm, Sweden, assignor to AB Tesi, Sweden

PCT No. PCT/SE81/00369, § 371 Date Aug. 2, 1982, § 102(e) Date Aug. 2, 1982, PCT Pub. No. WO82/02250, PCT Pub. Date Jul. 8, 1982
PCT Filed Dec. 11, 1981, Ser. No. 406,228
Claims priority, application Sweden, Dec. 23, 1980, 8009126
Int. Cl.³ G01N *33/48*
U.S. Cl. 436—70 **2 Claims**



1. A method of time-marking the end of a reaction period of certain length in a sedimentation process in which at least two fractions in a sample containing liquid are to be separated at least partially according to their specific weights in a tube by non-centrifugal sedimentation for a certain period, the method comprising:
contacting said sample in said tube, prior to sedimentation, with a plug of hydrophilic substance that has original

dimensions smaller than the inner diameter of the tube and a specific weight lying between the specific weights of said fractions, and the plug having a swelling rate related to its dimensions and substance adjusted for the plug to absorb liquid during the sedimentation, and thereby to swell and jam in the tube after a predetermined period of time corresponding to said certain period, and mark the separation line between the fractions at the end of said certain period;

allowing said non-centrifugal sedimentation to occur; and

reading the position of the plug in said tube in a vertical direction after said certain period.

4,477,575

PROCESS AND COMPOSITION FOR SEPARATING PLASMA OR SERUM FROM WHOLE BLOOD

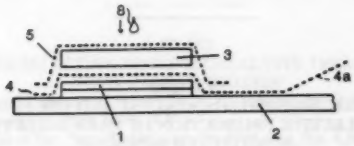
Peter Vogel; Hans-Peter Braun, both of Hemsbach; Dieter Berger, Viernheim, and Wolfgang Werner, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Aug. 4, 1981, Ser. No. 289,943

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1980, 3029579

Int. Cl.³ G01N *1/18, 33/52*

U.S. Cl. 436—170 **16 Claims**



1. A process for separating plasma or serum from whole blood, comprising: trickling blood slowly onto a layer of glass fibers with an average diameter of 0.2 to 5μ and a density of 0.1 to 0.5 g./cm³, the total volume of the plasma or serum to be separated being at most 50% of the absorption volume of the glass fiber layer; and collecting the run-through from the glass fiber layer which is plasma or serum.

4,477,576

ANTIGEN ASSAY METHOD AND KIT

Alice Deutsch, New York; Harvey Brandwein, Port Washington; Herbert Platt, Great Neck; Dianne M. Hunter, New Rochelle; Andrew Dubitsky, Amityville, and Susan M. Durham, Westbury, all of N.Y., assignors to Mex Research Associates, White Plains, N.Y.

Filed Jul. 26, 1982, Ser. No. 401,460

Int. Cl.³ G01N *33/54*

U.S. Cl. 436—500 **28 Claims**

28. A method of determining the concentration of an antigen in a sample solution comprising

(a) coating a protein conjugate of said antigen onto a solid matrix,

(b) independently conjugating an enzyme to a monoclonal antibody specific for said antigen,

(c) incubating a known quantity of a solution containing the antibody-enzyme conjugate of (b) with a specified quantity of a sample containing an unknown amount of the antigen whose content is to be determined,

(d) contacting the coated solid matrix of (a) with the solution (c) and incubate so as to effect binding between the antibody and antigen, some of the antigen being that from the sample and some being that on the solid substrate,

(e) removing the solid matrix from the solution and washing,

(f) immersing the solid matrix in a solution containing a known amount of an enzyme-substrate which is acted upon by the enzyme so as to effect reaction between the enzyme and enzyme-substrate, and then separating the solid matrix from the solution of enzyme-substrate, and

(g) then measuring the solid matrix or the solution of enzyme-substrate with a pre-established standard to indicate the amount of antigen which was in the sample added in (c).

4,477,577

NON-CONTAMINATING DIRECT SERUM ASSAY OF STEROID HORMONES

Robert M. Nakamura, Rolling Hills Estates; Daniel R. Misbell, Palos Verdes Estates, both of Calif., and Paul G. Stumpf, Palmyra, Pa., assignors to University of Southern California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 130,663, Mar. 17, 1980, abandoned. This application Sep. 18, 1981, Ser. No. 303,440

Int. Cl.³ G01N *33/56, 33/58*

U.S. Cl. 436—510 **10 Claims**

1. In a method for direct serum assay of a target steroid hormone, employing the counting of a tagged antigen, in which binding protein competes with an antibody that is added to the serum sample along with the tagged antigen for the target steroid hormone, the improvement comprising:

adding to the serum a synthesized compound which does not exist naturally in the serum being assayed, said component being non-immuno-reactive with the antibody and having sufficient competing affinity for binding protein with the target steroid hormone to release an amount of the target steroid hormone sufficient to permit accurate quantification thereof.

4,477,578

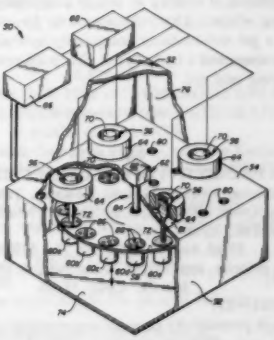
METHOD AND APPARATUS FOR PERFORMING ASSAYS

Laughton E. Miles, Stanford; Arthur H. Rogers, Jr., Los Altos, both of Calif., and Charles H. Rogers, Duxbury, Mass., assignors to Medical & Scientific, Inc., Rockland, Mass.

Filed Mar. 4, 1982, Ser. No. 354,848

Int. Cl.³ G01N *33/54, 33/56, 35/04, 35/06*

U.S. Cl. 436—518 **21 Claims**



1. A method for determining an analyte which is a member of a specifically binding pair in a sample fluid, said method comprising:

introducing into a reaction zone comprising one member of the specifically binding pair immobilized within the interior of a receptacle having a single port (a) the sample fluid by immersing the receptacle port beneath the surface of the sample fluid and elevating the pressure surrounding the receptacle and (b) a labelling reagent comprising a detectable label conjugated to one member of a specifically binding pair by immersing the receptacle port beneath the surface of a solution of said reagent to entrap a

fixed amount of gas in the receptacle, and elevating the surrounding pressure to introduce reagent into the receptacle and compress the gas until the pressure inside the receptacle substantially equals the surrounding pressure, whereby a portion of the labelling reagent becomes bound to the reaction zone, the extent of said portion being related to the amount of analyte in the sample fluid;

expelling the mixture of said sample fluid and said labelling reagent from the reaction zone by lowering the surrounding pressure; and

detecting the amount of bound label.

4,477,579

ELECTRODE COATING AND COATED ELECTRODES

Frederick V. Reven, Homewood, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Apr. 14, 1983, Ser. No. 484,928
Int. Cl.³ C04B 35/00
U.S. Cl. 501—1 6 Claims

1. A coating composition consisting essentially of in percentages by weight:

a. 15–50% zinc chloride

b. 5–25% powdered alumina

c. 1–10% alkalinity control agent selected from the group consisting of alkali metal hydroxides and alkali metal carbonates

d. balance water said composition being free of boron, silicon and phosphorus compounds.

4,477,580

METHOD FOR MAKING GERMANIUM-SILICATE GEL GLASS AND ARTICLES

James W. Fleming, Jr., Fanwood, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 28, 1982, Ser. No. 425,692
Int. Cl.³ C03C 3/04, 3/12
U.S. Cl. 501—12 4 Claims

1. A method of making an article comprising a germanium-containing silicate glass characterized by steps comprising forming a gel substantially comprising hydrolyzed tetra pentyloxygermane and a hydrolyzed silicon alkoxide, and substantially drying said gel.

4,477,581

HIGH PERMITTIVITY CERAMIC COMPOSITIONS

Goro Nishioka, Yawata; Hiroshi Komatsu, Takefu, and Yukio Sakabe, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Aug. 3, 1983, Ser. No. 519,906
Claims priority, application Japan, Aug. 4, 1982, 57/135931
Int. Cl.³ C04B 35/46
U.S. Cl. 501—137 1 Claim

1. A high permittivity ceramic composition consisting essentially of a main component expressed by the general formula:

$$(Ba_{1-x}Me_x)(Ti_{1-y}Me'_y)O_3$$

wherein

Me is Ca and/or Sr, Me' is Zr and/or Sn, x and y are respective mole fractions of Me and Me', $0.06 \leqq x \leqq 0.14$, and $0.06 \leqq y \leqq 0.14$; and

a secondary component consisting essentially of 65 to 90 mol % of $PbTiO_3$, 1 to 10 mol % of $Pb_5Ge_3O_{11}$ and 1 to 30 mol % of $Bi_2Ti_2O_7$, the content of said secondary component being 5 to 15 weight percent of the amount of the main component.

4,477,582

REACTIVATION OF STEAM-DEACTIVATED CATALYSTS

Joseph N. Miale, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 249,584, Mar. 31, 1981, abandoned. This application Feb. 4, 1983, Ser. No. 463,746
Int. Cl.³ B01J 29/38, 29/06; C10G 11/05
U.S. Cl. 502—26 9 Claims

1. A process for reactivating a catalyst composition comprising a crystalline zeolite material having a silicon/aluminum atomic ratio of at least about 3.5, said catalyst composition having been contacted with steam under conditions sufficient to deactivate same by removal of aluminum from the zeolite framework, which comprises the steps of

contacting said steam-deactivated catalyst composition with an aqueous metal salt solution of from about 0.05 N to about 5 N, said metal selected from the group consisting of alkali, alkaline earth and transition metals, at a temperature of from about 20° C. to about 100° C. for from about 15 minutes to about 240 minutes, and

contacting said metal salt solution contacted catalyst composition with an aqueous ammonium ion solution of from about 0.05 N to about 5 N at a temperature of from about 20° C. to about 100° C. for from about 15 minutes to about 240 minutes.

4,477,583

SILICA-MODIFIED CATALYST AND USE FOR SELECTIVE PRODUCTION OF PARA-DIALKYL SUBSTITUTED BENZENES

Paul G. Rodewald, Rocky Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 9, 1983, Ser. No. 502,856
The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.
Int. Cl.³ B01J 29/28
U.S. Cl. 502—71 13 Claims

1. A method for preparing a composition comprised of a crystalline zeolite having deposited thereon a coating of silica which extensively covers and resides substantially exclusively on the external surface thereof, which comprises

contacting a crystalline zeolite with an aqueous emulsion of a silicon-containing compound of a molecular size substantially incapable of entering the pores of the zeolite, said compound having the general formula:

where

R_1 is hydrogen, fluorine, hydroxy, alkyl, aralkyl, alkaryl or fluoro-alkyl, the hydrocarbon substituents containing from 1 to 10 carbon atoms, R_2 is selected from the same group as R_1, other than hydrogen, and other than methyl if R_1 is hydrogen, and n is an integer of at least 10, said contacting at a temperature of from about 10° C. to about 200° C. for a time sufficient to permit from about 0.5 weight percent to about 30 weight percent silica to be deposited on the crystalline zeolite upon heating in an oxygen-containing atmosphere at a temperature of from 300° C. to about 700° C., and

heating the aqueous emulsion contacted crystalline zeolite in

an oxygen-containing atmosphere at a temperature of from about 300° C. to about 700° C. to yield said composition.

4,477,584

PARA-SELECTIVE ZEOLITE CATALYSTS TREATED WITH NITROGEN COMPOUNDS

Warren W. Kaeding, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 277,485, Jun. 26, 1981, Pat. No. 4,370,508. This application Aug. 30, 1982, Ser. No. 413,191

Int. Cl.³ B01J *29/06, 29/28, 27/14*

U.S. Cl. 502—77 9 Claims

1. A process for treating zeolite based catalysts, said catalysts comprising a crystalline zeolite material characterized by a silica to alumina ratio of at least 12 and a Constraint Index of from about 1 to 12 catalysts having from about 0.25% to 25% by weight of a modifying oxide selected from magnesium oxide, phosphorus oxide and mixtures of said oxides, said process comprising contacting said oxide treated catalyst with a nitrogen-based treating agent selected from nitrogen dioxide and ammonia under conditions capable of enhancing the para-selectivity of said catalyst in the conversion of aromatic compounds to dialkyl-substituted benzene compounds.

4,477,585

PARA-SELECTIVE ZEOLITE CATALYSTS TREATED WITH CARBON DIOXIDE

Warren W. Kaeding, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 277,484, Jun. 26, 1981, Pat. No. 4,367,359. This application Aug. 30, 1982, Ser. No. 413,192

Int. Cl.³ B01J *29/06, 29/28, 27/14*

U.S. Cl. 502—77 9 Claims

1. A process for treating zeolite based catalysts, said catalysts comprising a crystalline zeolite material characterized by a silica to alumina ratio of at least 12 and a constraint index of from about 1 to 12 and from about 0.25% to 25% by weight of a modifying oxide selected from magnesium oxide, phosphorus oxide and mixtures of said oxides, said process comprising contacting said catalyst with a carbon dioxide treating agent under conditions capable of enhancing the para-selectivity of said catalysts in the conversion of aromatic compounds to dialkyl-substituted benzene compounds.

4,477,586

POLYMERIZATION OF OLEFINS

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 412,059, Aug. 27, 1982, abandoned. This application Feb. 4, 1983, Ser. No. 464,095

Int. Cl.³ C08F *4/64, 4/68, 4/62*

U.S. Cl. 502—104 15 Claims

1. A process comprising contacting a first reactant selected from the group consisting of $R_2Si(OH)_2$ and R_3SiOH, where R represents an aryl group having from 6 to about 20 carbon atoms and a second reactant comprising a halogenated transition metal compound represented by the formula

$$M(OR')_vX_{w+1}$$

wherein M represents a transition metal selected from the group consisting of Group IVB, VB and VIB of the Periodic Table, R' comprises a hydrocarbyl moiety having from 1 to about 20 carbon atoms, X represents a halogen atom selected from the group consisting of chlorine, bromine and iodine, v equals 0, 1, 2 or 3, w equals 1, 2, 3 or 4, and v+w+1 equals the valence of M, to produce a catalyst precursor.

4,477,587

SUPPORTED CATALYST FOR POLYMERIZATION OF OLEFINS

Elliot I. Band, Yonkers, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 20, 1982, Ser. No. 451,627

Int. Cl.³ C08F *4/64, 4/68*

U.S. Cl. 502—111 18 Claims

10. A process for preparing a catalyst for polymerizing olefins comprising the steps of:

(a) reacting in liquid states at least one organometallic compound whose metal comprise members of Groups I to III of the periodic table and in which at least one of the metals must be magnesium with an alcohol, ROH, where R is an alkyl, cycloalkyl, or arylalkyl moiety having 1 to 16 carbon atoms, a polysiloxane, and a transition metal halide to form a solid;

(b) treating the solid with a transition metal halide to form a treated solid; and

(c) reacting the treated solid with an electron donor and a transition metal halide to form the component.

4,477,588

POLYOLEFIN POLYMERIZATION PROCESS AND CATALYST

Gil R. Hawley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 15, 1982, Ser. No. 449,933

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—119 11 Claims

1. A catalyst for the polymerization of olefins comprising the product resulting when reactants comprising

(a) a magnesium dihalide,

(b) 4-phenyl phenol,

(c) ethyl benzoate, and

(d) titanium tetra-n-butoxide

are reacted to form a first catalyst component and said first catalyst component is reacted with an organoaluminum halide comprising ethylaluminum sesquichloride and then the solid product of that reaction is reacted with a mixture of halogen containing compounds comprising $TiCl_4$, $HSiCl_3$, and $SiCl_4$, wherein the sum of the volumes of $HSiCl_3$ and $SiCl_4$ in the mixture is about equal to volume of $TiCl_4$ in the mixture.

4,477,589

CATALYSTS FOR THE POLYMERIZATION OF EPOXIDES AND PROCESS FOR THE PREPARATION OF SUCH CATALYSTS

Harm van der Hulst; George A. Pogany, and Jan Kuyper, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 14, 1983, Ser. No. 475,018

Claims priority, application United Kingdom, Mar. 31, 1982, 8209419

Int. Cl.³ B01J *31/02*

U.S. Cl. 502—169 14 Claims

1. Compounds according to the general formula:

$$M^1_a[M^2(CN)_b(A)_c]_d \cdot wM^3D_e \cdot xH_2O \cdot yL \cdot zH_nE_m \quad (I)$$

wherein M^1 represents at least one of Zn(II), Fe(II), Co(II), Ni(II), Mn(II), Cu(II), Sn(II) or Pb(II); M^2 represents at least one of Fe(II), Fe(III), Co(III), Cr(III), Mn(II), Mn(III), Ir(III), Rh(III), Ru(II), V(IV) or V(V); M^3 represents M^1 and/or M^2; A, D and E each represent an anion which may be the same or different; L represents an alcohol, aldehyde, ketone, ether, ester, amide, nitrile or sulphide or mixtures thereof; a and d are numbers to satisfy the valency state of M^1 and M^2 in the double metal cyanide part of the general formula I; b and c are integers (b>c) which together with a and d provide the electroneutrality of the double metal cyanide part of the general formula I; e is an integer satisfying the valency state of M^3; n and m are integers satisfying the electroneutrality of HE, and

w is a number between 0.1 and 4;
x is a number up to 20;
y is a number between 0.1 and 6, and
z is a number between 0.1 and 5.

4,477,590

SEPARATELY SUPPORTED POLYMETALLIC REFORMING CATALYST

Charles T. Kresge, Sewell; Sowmithri Krishnamurthy, Cherry Hill, and William D. McHale, Swedesboro, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 24, 1983, Ser. No. 525,778
Int. Cl.³ B01J *21/04, 23/42, 23/46, 23/64*
U.S. Cl. 502—334 **5 Claims**

1. A catalyst composition made up of a mixture of two components one component comprising a minor proportion of platinum and rhenium on a carbon dioxide treated support and the second component comprising a minor proportion of iridium and rhenium on a separate carbon dioxide treated support.

4,477,591

METHOD FOR PREPARING A CATALYST FOR THE DEHYDRATION OF AN ALKANOLAMINE

Enrique G. Ramirez, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 281,611, Jul. 9, 1981, Pat. No. 4,376,732, which is a division of Ser. No. 167,881, Jul. 14, 1980, Pat. No. 4,337,175. This application Jan. 14, 1983, Ser. No. 457,983
The portion of the term of this patent subsequent to Jun. 29, 1999, has been disclaimed.
Int. Cl.³ B01J *23/20*
U.S. Cl. 502—340 **16 Claims**

1. The process of making a catalyst useful for dehydrating an alkanolamine to form an alkylenimine which comprises dissolving a tantalum or niobium compound in water or in hydrofluoric acid, neutralizing the so-formed solution with ammonium hydroxide to precipitate the hydroxide of said metal, thereafter washing said precipitate and dissolving in an aqueous solution of a lower carboxylic acid to form a solution of the metal salt of said acid, applying said aqueous metal salt solution to an inert support to impregnate said support with said metal salt and heating said impregnated support to calcine said metal salt to form a catalytic metal oxide on said support.

4,477,592

CATALYST FOR SKELETAL ISOMERIZATION

Arthur W. Aldag, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 443,720, Nov. 22, 1982, Pat. No. 4,446,013. This application Jan. 23, 1984, Ser. No. 573,163
Int. Cl.³ B01J *21/04, 21/06, 23/06*
U.S. Cl. 502—342 **10 Claims**

1. A catalyst composition comprising a hydrogel of zinc titanate and an acidic carrier.

4,477,593

SHEET PRINTED WITH INVISIBLE INKS, DEVELOPERS AND ERASURE COMPOUNDS FOR INVISIBLE INKS

Roderick P. J. Tomlinson, Glen Waverley, Australia, assignor to Lockley Services Pty. Ltd.; Graham Charles Barry and Norman John Field, all of Victoria, Australia, a part interest

Division of Ser. No. 965,874, Dec. 4, 1978, Pat. No. 4,322,466. This application Mar. 2, 1982, Ser. No. 353,818
Claims priority, application Australia, Dec. 2, 1977, PD2656/77; Dec. 2, 1977, PD2655/77
Int. Cl.³ B41M *3/14, 5/14*
U.S. Cl. 346—205 **6 Claims**

1. A system of developing an invisible ink and erasing the resultant developed ink comprising a surface having applied thereto one or more invisible inks, an applicator fluid including at least a developer compound and an erasure compound, such that, on application of the fluid to the surface, the ink initially becomes visible and subsequently, after a predetermined period of time, reassumes an invisible state.

4,477,594

PROCESS FOR THE SYNTHESIS OF ALIPHATIC ALCOHOL-CONTAINING MIXTURES

Marvin I. Greene, Oradell, and Abraham P. Gelbein, Morristown, both of N.J., assignors to Chem Systems, Inc., Tarrytown, N.Y.

Filed Dec. 16, 1982, Ser. No. 450,341
Int. Cl.³ C07C *27/06, 31/00*
U.S. Cl. 518—700 **25 Claims**

1. A process for the synthesis of mixtures including C_2–C_9 saturated aliphatic alcohols comprising:

a first stage activation step in which a catalyst comprising the oxides of copper, zinc, aluminum, potassium and one or two additional metals selected from the group consisting of chromium, manganese, cerium, cobalt, thorium and lanthanum is activated by contact with a reducing gas stream comprising hydrogen and at least one inert gas, said reducing gas flowing at a space velocity of up to 5000 liters (STP) per hour per kilogram of catalyst whereby said catalyst is partially activated;

subjecting said partially activated catalyst to a second state activation step wherein said catalyst is contacted by an activation gas stream comprising hydrogen and carbon monoxide, present in a volume ratio in the range of between 0.5:1 and 4:1, respectively, at a temperature in the range of between 200° and 450° C. and a pressure in the range of between 35 and 200 atmospheres, said activation gas flowing at a space velocity in the range of between 1,000 and 20,000 liters (STP) per hour per kilogram of catalyst, said second stage activation continuing until at least 500,000 liters (STP) of activation gas per kilogram of catalyst contacts said catalyst, whereby said catalyst is fully activated;

synthesizing a mixture including saturated aliphatic alcohols by contacting a synthesis gas stream comprising hydrogen and carbon monoxide present, respectively, in a volume ratio in the range of between 0.5:1 and 4:1, flowing at a space velocity in the range of between 1,000 and 20,000 liters (STP) with said activated catalyst at a temperature in the range of between 200° and 450° C. and a pressure in the range of between 35 and 200 atmospheres.

4,477,595

LIQUID HYDROCARBON SYNTHESIS USING SUPPORTED RUTHENIUM CATALYSTS

Rostam J. Madon, Scotch Plains, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 363,951, Mar. 31, 1982, abandoned, which is a continuation of Ser. No. 264,426, May 18, 1981, abandoned. This application Apr. 28, 1983, Ser. No. 489,562

Int. Cl.³ C07C *1/04*

U.S. Cl. 518—715 **15 Claims**

1. A process for selectively producing paraffins comprising:

(a) first contacting a mixture of H_2 and CO for at least 10 hours with a reduced and supported ruthenium catalyst, said ruthenium catalyst comprising ruthenium on a support selected from the group consisting of TiO_2, $ZrTiO_4$, TiO_2-carbon, TiO_2-Al_2O_3, TiO_2-SiO_2, alkaline earth titanates, alkali titanates, rare earth titanates, V_2O_3, Nb_2O_5, Ta_2O_5, Al_2O_3-V_2O_3, Al_2O_3-Nb_2O_5, Al_2O_3-Ta_2O_5, SiO_2-V_2O_3, SiO_2-Nb_2O_5, SiO_2-Ta_2O_5, V_2O_3-carbon, Nb_2O_5-carbon, Ta_2O_5-carbon, alkaline earth Group VB oxides, alkali-Group VB oxides, rare earth-Group VB oxides, Group IVB-Group VB oxides, and mixtures thereof, at Fischer-Tropsch conditions such that the temperature ranges from about 100° to 400° C., the pressure ranges from about 0.2 to 10 MPaA, the gas hourly space velocity, GHSV, ranges from about 100 to 50,000 v/v/hr., and wherein the ratio of GHSV/pressure is below about 24,000 v/v/hr./MPaA, and at least about a 20% CO conversion is effected; and

(b) continuing said contacting as in step (a) at a H_2/CO molar ratio from about 0.1 to 4 and thereafter recovering a hydrocarbon mixture comprising C_5–C_{40} hydrocarbons, containing C_5–C_{20} paraffins and olefins in a paraffins to olefins weight ratio of at least about 1.5.

4,477,596

AMPHOTERIC ION EXCHANGER AND METHOD OF MAKING SAME

Teruo Fujimoto, Nagaoka, Japan, assignor to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Apr. 23, 1982, Ser. No. 371,311

Claims priority, application Japan, Oct. 30, 1981, 56-173810

Int. Cl.³ B01J *43/00*

U.S. Cl. 521—25 **14 Claims**

1. An amphoteric ion exchanger consisting of a macromolecular chain A^- having a cation exchange group, a macromolecular chain B^+ having an anion exchange group and a macro-molecular chain C having no ion exchange group, said chains being linked together into a straight chain in such a manner that the macro-molecular chains A^- and B^+ are not adjoining each other; each of said macromolecular chains A^- and B^+ being at least 5% by weight of the amphoteric ion exchanger and said macromolecular chain C having no ion exchange group being 30–90% by weight of the amphoteric ion exchanger, said weights being on an ion exchange group-free basis.

4,477,597

HIGHER DENSITY ION EXCHANGE RESINS OF METAL COMPOUND PRECIPITATED WITHIN PORES

John M. Lee; William C. Bauman, both of Lake Jackson; Richard A. Wolcott, Richwood, and John L. Burba, III, Angleton, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 2, 1981, Ser. No. 307,829

Int. Cl.³ B01J *39/20, 41/14*

U.S. Cl. 521—28 **19 Claims**

1. A method for providing a macroporous ion exchange resin showing reduced upflow bed expansion, said method comprising depositing within the pores of said resin a substantially insoluble weighting agent thereby preparing a composite material which has a higher apparent density than the apparent density of the starting resin, wherein the depositing of the weighting agent into said resin is accomplished by the process comprising incorporating into the pores of said resin at least one soluble compound of Zr, Ti, Si, Sn, Pb, Co, Fe, Ni, Cu or Hg and reacting said soluble compound with a reagent which converts the soluble compound in-situ in the pores to at least one insoluble metal or metal compound.

4,477,598

HIGH STRENGTH NYLON BLEND MEMBRANES

Robert E. Kesting, Irvine, Calif., assignor to Puropore, Inc., Tustin, Calif.

Division of Ser. No. 370,340, Apr. 21, 1982, Pat. No. 4,450,126. This application Mar. 2, 1984, Ser. No. 585,563

Int. Cl.³ C08J *9/28*

U.S. Cl. 521—62 **7 Claims**

1. A high void volume integral microporous membrane formed by the dry phase inversion process consisting essentially of a blend of two nylon polymers cast from a formic acid solution of said polymers, said polymers being in a ratio of from about 1:1 to about 9:1 of high molecular weight crystalline nylon homopolymer to amorphous nylon multipolymer.

4,477,599

METHOD OF PREPARING A LOW DENSITY, NONFLAMMABLE POLYVINYL FOAM COMPOSITION

Takayuki Otsu, Nara, and Hirosuke Kojima, Owase, both of Japan, assignors to Hirosuke Kojima, Japan

Filed Nov. 8, 1982, Ser. No. 439,981

Claims priority, application Japan, Jul. 5, 1982, 57-117100

Int. Cl.³ C08J *9/00*

U.S. Cl. 521—89 **3 Claims**

1. A method of preparing a foamable polyvinyl resin composition suitable for forming nonflammable foamed products having compressive strengths greater than 10 kg/cm^2 and densities less than 100 kg/m^3, said method comprising the step of reacting (a) polyvinyl chloride resin; (b) at least 0.05 parts by weight organic initiator per 1 part by weight of polyvinyl chloride resin, said organic initiator being selected from the group consisting of azobisalkylnitrile, azobiscyclohexylcarbonitrile, azobisester, phenylazotriphenylmethane, phenylazothiophenylether, phenylazophenylamine, azobisbenzoyl, tetraalkylterazane, 4,4'-azobis-4-cyano valeric acid, dibenzothiazoledisulfide, metal compound of 2-mercapto benzothiazole, N-cyclohexyl-2-benzothiazolysulphenamide, tetraalkylthiuramdisulfide, and metal derivatives of dialkyldithiocarbamic acid; (c) 2–100 parts by weight of at least one inorganic filler per 1 part by weight of polyvinyl chloride resin; and (d) an effective amount of at least one blowing agent.

4,477,600

POLYURETHANE FOAMS HAVING LOW SCORCH DISCOLORATION

Gerald Fesman, Teaneck, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 23, 1983, Ser. No. 535,086

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—108 **17 Claims**

1. A method of making flame retardant polyurethane foams having improved scorch and surface discoloration properties by reacting an organic polyol and an organic isocyanate in the presence of a halogenated phosphoric acid ester flame retardant, phenothiazine, and 4,4'-thio-bis-(6-tertiary butyl meta cresol), wherein the improvement comprises: adding to the reaction an organophosphite in an amount effective to reduce scorch and surface discoloration.

4,477,601

HIGH RESILIENCY MOLDED URETHANE FOAMS CONTAINING HIGH LEVELS OF GRAFT COPOLYMER POLYOLS

David R. Battice, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 16, 1983, Ser. No. 552,525
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—111 **14 Claims**

1. A composition consisting essentially of

(A) 100 parts by weight of a base polyether polyol selected from the group consisting of

1. a polyether triol containing at least 40 mole percent of primary hydroxyl groups and having a molecular weight in the range of 2,000 to 8,000 grams per mole.
2. a graft copolymer polyol, and
3. mixtures thereof;

(B) a sufficient amount of organic polyisocyanate to give from 90 to 120 percent, on a stoichiometric basis, of isocyanate radicals for each hydroxyl radical in the composition;

(C) a catalytic amount of a catalyst for the production of the polyurethane foam;

(D) 1 to 10 parts by weight of a blowing agent;

(E) a foam stabilizing amount of a blend of polysiloxane-polyoxyalkylene copolymers consisting essentially of

1. 78 to 97 percent by a weight of a polydimethylsiloxane-polyoxyalkylene copolymer wherein the polysiloxane contains no more than ten silicon atoms and the polysiloxane has at least one polyoxyalkylene substituent having the general formula selected from the group consisting of

$$-D(OR'')_mA \text{ and}$$

$$-L-D(OR'')_mA \text{ wherein}$$

L is an oxygen or a sulfur atom bonded to a carbon atom of the D radical;

D is a divalent linking radical, containing no more than 8 carbon atoms, selected from the group consisting of

(a) alkylene radicals,

(b) radicals composed of carbon, hydrogen, and oxygen, the oxygen atoms being present as ether, ester, or hydroxy groups, and

(c) radicals composed of carbon, hydrogen, and sulfur atoms, the sulfur atoms being present as thioether, thioester, or thiol groups;

R'' is composed of propylene radicals and radicals selected from the group consisting of ethylene and butylene radicals wherein the amount of ethylene and butylene radicals is 0 to 35 weight percent of the total (OR'') radical;

m has an average value of 1 to 15;

A is a radical selected from the group consisting of the —OR′, OOCR′, and

$$-\underset{\underset{O}{\|}}{O}CR'$$

radicals wherein R′ is a radical free of aliphatic unsaturation selected from the group consisting of hydrocarbons and hydrocarboxy radicals, the A radical containing a total of less than eleven carbon atoms; and

2. 3 to 22 percent by weight of a polydimethylsiloxane-polyoxyalkylene copolymer, said copolymer containing at least 13 percent by weight of dimethylsiloxane units based on the weight of the copolymer, wherein the polysiloxane has at least three polyoxyalkylene substituents having the general formula

$$-D'(OR''')_kA \text{ and}$$

$$-L-D'(OR''')_kA \text{ wherein}$$

L is an oxygen or sulfur atom bonded to a carbon atoms of the D′ radical;

D′ is a divalent linking radical containing from 1 to 30 carbon atoms selected from the group consisting of

(a) alkylene radicals,

(b) radicals composed of carbon, hydrogen, and oxygen atoms, the oxygen atoms being present as ether, ester, or hydroxy group, and

(c) radicals composed of carbon, hydrogen, and sulfur atoms, the sulfur atoms being present as thioether, thioester, or thiol groups;

R''' is composed of ethylene radicals and radicals selected from the group consisting of propylene and butylene radicals, the amount of ethylene radicals relative to the other alkylene radicals being such that the ratio of the carbon atoms to oxygen atoms in the total OR''' block ranges from 2.3:1 to 2.8:1;

k has an average value from 25 to 100;

A is a radical selected from the group consisting of the —OR′, OOCR′, and

$$-\underset{\underset{O}{\|}}{O}CR'$$

radicals wherein R′ is a radical free of aliphatic unsaturation selected from the group consisting of hydrocarbon and hydrocarboxy radicals, the A radical containing a total of less than eleven atoms.

4,477,602

NOVEL SYSTEM FOR THE PRODUCTION OF POLYURETHANES

Tai-M[i]ng Liang, Pittsburgh, and Keith G. Spitler, Bethel Park, both of Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 25, 1983, Ser. No. 517,087
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—137 **23 Claims**

1. A polyurethane product formed by reacting

(a) an isocyanate selected from the group consisting of 4,4′-diisocyanatodiphenylmethane, isocyanates based on 4,4′-diisocyanatodiphenylmethane, and mixtures thereof,

(b) at least one polyether polyol having at least two and no more than three hydroxyl groups,

(c) from about 5 to about 40 percent by weight based on the total weight of components (b) and (c) of a dispersion of a polyurea and/or a polyhydrazodicarbonamide in an organic compound containing at least two hydroxyl groups, and wherein the total solids content of the mixture of component (b) and component (c) is from about 1 to 8 parts by weight, and

(d) from about 5 to about 15 percent by weight based on the total weight of components (b), (c) and (d) of a compound selected from the group consisting of ethylene glycol, 1,4-butanediol, and mixtures thereof, in the presence of

(e) a blowing agent, and, optionally catalyst and surfactant, wherein the amount of component (a) is such that the isocyanate index is from about 94 to about 105.

4,477,603

STABLE DISPERSIONS OF POLYMERS IN POLYFUNCTIONAL ACTIVE HYDROGEN COMPOUNDS AND POLYURETHANES BASED THEREON

Thomas E. Fisk, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 467,410, Feb. 17, 1983, abandoned. This application Dec. 9, 1983, Ser. No. 560,039

Int. Cl.³ C08G *18/14, 18/63;* C08L *75/00*

U.S. Cl. 521—137 18 Claims

1. A stable improved copolymer dispersion which comprises:

(A) a polyahl having dispersed therein;

(B) an addition copolymerizate of (1) a monomeric adduct of (a) an active ethylenically unsaturated haloformate or haloformylthiolate monomer and (b) a monoahl or a polyahl with (2) at least one other ethylenically unsaturated monomer; or

(C) (1) an addition copolymer of a haloformate or haloformylthiolate monomer with at least one other ethylenically unsaturated monomer and (2) a monoahl or polyahl; or

(D) a mixture of (B) and (C); or

(E) a mixture of (B) and/or (C) and a polymer of at least one other ethylenically unsaturated monomer.

17. A polyurethane composition prepared by reacting the copolymer dispersion of claim 1 with an organic polyisocyanate.

4,477,604

POLYURETHANE COMPOSITIONS AND THEIR USE AS LUTING AGENTS

Sixtus J. Oechsle, III, 3907 Henry Ave., Philadelphia, Pa. 19129

Filed Sep. 20, 1982, Ser. No. 419,999

Int. Cl.³ A61K *6/08*

U.S. Cl. 523—116 7 Claims

1. A 100% solid luting agent for human beings and other animals comprising the reaction product of a polyurethane-forming or poly(urea)urethane-forming prepolymer, a curing agent and a filler, all of which are pharmaceutically acceptable.

4,477,605

ASBESTOS-FREE FRICTION MATERIALS

Howard S. Okubo, Chicago; Clarence E. Albertson, Villa Park, and Roger K. Nibert, Hoffman Estates, all of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 21, 1983, Ser. No. 477,194

Int. Cl.³ C08F *212/34*

U.S. Cl. 523—155 7 Claims

1. An asbestos-free, pad-type, friction material having good friction stability and wear properties consisting essentially of an inorganic fiber, a binder, from about 5 to about 20 parts of zinc oxide and from about 5 to about 25 parts of molybdenum sulfide.

4,477,606

WATER RESISTANT ROOM TEMPERATURE VULCANIZABLE POLYORGANOSILOXANE COMPOSITIONS AND METHOD FOR PREPARING SAME

Miyoji Fukayama; Noriyuki Suganuma, both of Ichihara, and Toshio Saruyama, Narashino, all of Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1983, Ser. No. 542,859

Claims priority, application Japan, Oct. 19, 1982, 57-183069

Int. Cl.³ C08K *3/26*

U.S. Cl. 523—200 30 Claims

1. A room temperature vulcanizable calcium carbonate-filled polyorganosiloxane composition which is stable in the absence of moisture, curable in the presence of moisture, and exhibits water resistance and adhesion during curing, said composition comprising

(A) 100 parts by weight of a hydroxyl endblocked polyorganosiloxane having a viscosity at 25° C. of at least 0.02 Pa-s,

(B) from 0.5 to 30 parts by weight of an organosilicon compound containing 2 amide groups per molecule,

(C) from 0 to 15 parts by weight of an organosilicon compound containing at least 3 amide, aminoxy or amino groups per molecule, and

(D) from 1 to 300 parts by weight of calcium carbonate which has been treated with a hydrophobicizing agent selected from the group consisting of cationic surfactants, nonionic surfactants exhibiting a maximum HLB value of 10, and organosilanes containing at least one silicon-bonded hydrocarbyl or substituted hydrocarbyl radical, where the substituent on said substituted hydrocarbyl radical is selected from the group consisting of amino, epoxy, acryloxy, and mercapto groups.

4,477,607

THIXOTROPIC CYANOACRYLATE COMPOSITIONS

Alan E. Litke, Naugatuck, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed Aug. 31, 1983, Ser. No. 528,275

Int. Cl.³ C08K *9/04, 5/54*

U.S. Cl. 523—212 10 Claims

1. In a composition comprising an α-cyanoacrylate ester monomer and a thixotropic agent, the improvement comprising that said composition is a non-flowable gel, said thixotropic agent is present in an amount of 12% or less and is a fumed silica having a surface treated with a trialkoxyalkylsilane and the said composition has a 2.5 RPM Brookfield viscosity of about 1×10^5 or greater.

4,477,608

COMPOSITIONS CONTAINING GRAPHITE

Fridolin Bäbler, Marly, Switzerland, and Adolf Weissmüller, Kandern, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 8, 1983, Ser. No. 520,938

Claims priority, application Switzerland, Aug. 20, 1982, 4980/82

Int. Cl.³ C08K *3/04, 9/04*

U.S. Cl. 523—215 9 Claims

1. A composition, which can be processed into moulded products, which comprises

(a) a thermoplastic high-molecular organic material selected from the group consisting of polyvinyl chloride, polyethylene, polypropylene, polystyrene, polycarbonate, polyacrylate, linear polyester, polyether, linear polyurethane and copolymers thereof,

(b) 0.001 to 3.0% by weight, relative to the high-molecular organic material, of graphite of a particle diameter of less than 100 microns, and

(c) 0.001 to 10.0% by weight, relative to the high-molecular organic material, of one or more organic pigments; polymer-soluble dyes; or inorganic pigments selected from the group consisting of iron oxide, antimony yellow, lead chromates, molybdenum red, ultramarine blue, cobalt blue, manganese blue, chromium oxide green, hydrated chrome oxide green, cobalt green, cadmium sulfide, zinc sulfide, arsenic disulfide, mercury sulfide, antimony trisulfide and cadmium sulfoselenides.

4,477,609

HYDROSOL COATING COMPOSITIONS HAVING IMPROVED STABILITY

Patrick F. Alsotto; Paul A. Drees, and Charles A. Soucek, all of Cincinnati, Ohio, assignors to Inmont Corporation, Clifton, N.J.

Continuation-in-part of Ser. No. 398,733, Jul. 15, 1982, abandoned, which is a continuation-in-part of Ser. No. 254,559, Apr. 15, 1981, abandoned, which is a continuation of Ser. No. 116,179, Jan. 28, 1980, abandoned. This application Jul. 20, 1983, Ser. No. 518,788

Int. Cl.³ C08L 63/10

U.S. Cl. 523—407 8 Claims

1. A hydrosol coating composition comprising

(a) 50–90% of an acrylic-poly(vinyl acetal) co-resin of which the acrylic moiety has two or more reactive sites per polymer chain,

(b) 5–50% of an epoxy resin having on the average 2 or less than 2 epoxide groups per polymer chain with at least one hydroxyl group per polymer chain and having an average molecular weight of 300 to 8,000,

(c) 3–40% of an aminoplast or phenolplast resin or combination thereof.

4,477,610

AQUEOUS DISPERSION COMPOSITIONS

Hidekazu Ishimura; Yoshimi Kakutani, and Naohisa Aoyagi, all of Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1981, Ser. No. 333,506

Claims priority, application Japan, Dec. 23, 1980, 55-182669; Feb. 24, 1981, 56-24854; Feb. 24, 1981, 56-24855

Int. Cl.³ C08L 63/10

U.S. Cl. 523—414 21 Claims

1. An aqueous dispersion composition which is prepared by uniformly mixing

(A) a mixture of aromatic compounds having epoxy groups and/or acryloyl or methacryloyl groups, said mixture containing an average of at least 0.5 epoxy groups and an average of from 0.1 to 1.5 acryloyl or methacryloyl groups per molecule, which mixture is prepared by reacting an aromatic epoxy resin with at least one of acrylic acid and methacrylic acid, and

(B) at least one ethylenic monomer, and then polymerizing the mixture; wherein the epoxy groups remain in said dispersion composition in an amount sufficient to cause a cross-linking reaction, wherein the weight ratio of (A) to (B) is from 90/10 to 10/90.

4,477,611

REINFORCED RUBBER COMPOSITION CONTAINING GROUND COAL

Richard J. Sperley, Troy, Mich., assignor to Uniroyal, Inc., New York, N.Y.

Filed Sep. 7, 1983, Ser. No. 530,163

Int. Cl.³ C08K 3/10, 5/01; C09J 3/14, 3/30

U.S. Cl. 524—71 5 Claims

1. A wire reinforced rubber composition comprising a mixture of (a) a sulfur vulcanizable rubber and (b) 5 to 30 parts ground coal per 100 parts rubber having an average mesh size of 25 or more and which produces an aqueous slurry with a pH of less than 7.0, and wherein a metallic reinforcing member is embedded in the rubber mixture of (a) and (b).

4,477,612

LIGNIN REINFORCED SYNTHETIC RUBBER

Stephen P. Boutsicaris, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jan. 27, 1983, Ser. No. 461,345

Int. Cl.³ C08L 97/00

U.S. Cl. 524—76 16 Claims

1. A novel lignin reinforced synthetic rubber comprising:

100 parts of a substituted acrylamide-containing synthetic rubber; and

from about five to 100 parts by weight of lignin, based upon the weight of said synthetic rubber;

wherein said substituted acrylamide-containing synthetic rubber comprises:

from about 40 to 98 percent by weight of a conjugated diene monomer;

from about 0.5 to 40 percent by weight of a monomer containing a vinyl group copolymerizable with said conjugated diene monomer; and

from about 0.5 to 15 percent by weight of an N-(alkoxymethyl)acrylamide monomer, the weight of each said monomer component being based upon the total weight of said substituted acrylamide-containing synthetic rubber; and

wherein said lignin reinforced synthetic rubber is prepared by coprecipitating a latex blend of said monomers with an acidified polyvalent metal ion solution so as to provide at least one equivalent mole of polyvalent metal ion with two equivalent moles of said N-(alkoxymethyl)acrylamide monomer bonded to the synthetic rubber latex.

4,477,613

STABILIZATION OF TACKIFYING RESIN DISPERSIONS

James M. Evans, Jacksonville; Kenneth E. Krajca; Keijo A. Ukkonen, both of Lynn Haven, and James E. Hansen, Panama City, all of Fla., assignors to Sylvachem Corporation, Panama City, Fla.

Filed Aug. 1, 1983, Ser. No. 519,451

Int. Cl.³ C09F 1/00, 7/00

U.S. Cl. 524—77 33 Claims

1. A stabilized aqueous dispersion of a resinous tackifier composition which comprises (a) a carboxyl-containing rosin derived resinous material having an acid value of from 50 to 150 and a softening point of from −25° to 150° C., said carboxyl-containing resinous material containing a counter ion capable of rendering said resinous material soluble or dispersible in water, (b) from 0.1% to 5% by weight of the total solids of said tackifier composition of a nonionic or anionic surfactant, and (c) from 3% to 14% by weight of the total solids of said tackifier composition of an elastomer in the form of a latex.

4,477,614

2-[2-HYDROXY-3,5-DI-TERT-OCTYLPHENYL]-2H-BENZOTRIAZOLE STABILIZED COMPOSITIONS

Martin Dexter, Briarcliff Manor, and Roland A. E. Winter, Armonk, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 236,466, Feb. 20, 1981, abandoned, which is a continuation of Ser. No. 068,275, Aug. 20, 1979, Pat. No. 4,283,327, which is a continuation of Ser. No. 006,391, Jan. 25, 1979, abandoned. This application Apr. 12, 1982, Ser. No. 367,718

The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.

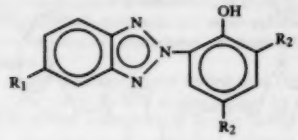
Int. Cl.³ C08K 5/34

U.S. Cl. 524—91 4 Claims

1. A stabilized composition which comprises

(a) a dyed polyamide, which is nylon 6/6, nylon 6 or poly(m-phenylene isophthalamide), and

(b) from 0.1 to 5% by weight of a compound of the formula



wherein R_1 is hydrogen or chloro, and R_2 is tert-octyl.

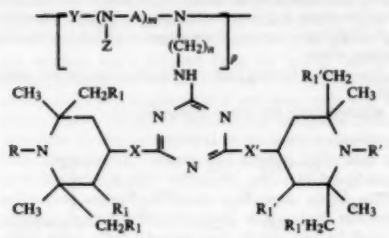
4,477,615

POLYPIPERIDINYL STABILIZING AGENTS FOR POLYMER MATERIALS

Giuseppe Raspanti, and Norberto Fossati, both of Mozzo, Italy, assignors to Apital Produzioni Industriali S.p.A., Milan, Italy

Filed Apr. 8, 1983, Ser. No. 483,092
Claims priority, application Italy, May 19, 1982, 21346 A/82
Int. Cl.[3] C07D *403/14;* C08G *73/04, 73/00;* C08K *5/34*
U.S. Cl. 524—100 17 Claims

1. Compounds having the general formula I



(I)

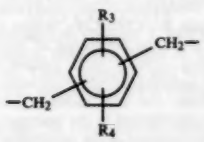
in which R and R′ can be the same or different, and represent hydrogen, a straight-chain or branched-chain alkyl radical having 1 to 12 carbon atoms, an alkenyl radical having 3 to 8 carbon atoms, an aralkyl radical having 7 to 19 carbon atoms;

R_1 and R'_1 can be the same or different and represent hydrogen or methyl;

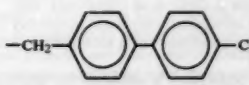
X and X′ can be the same or different and represent oxygen or the group N—R_2 in which R_2 represents hydrogen, straight-chain or branched-chain alkyl having 1 to 12 carbon atoms, a cycloalkyl radical having 5 to 12 carbon atoms, an aralkyl radical having 7 to 12 carbon atoms;

n can be 2 to 12;

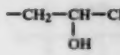
A represents —$(CH_2)_n$—, in which n has the previously defined meaning, the group:



in which R_3 and R_4 are hydrogen or methyl, the group

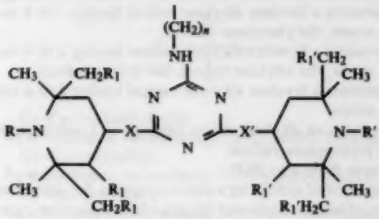


the group



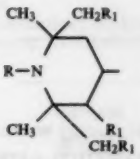
the group —CH_2—CH_2—$(O—CH_2—CH_2)_a$— in which a can be 1–3;

Z represents hydrogen, an alkyl radical having 1 to 18 carbon atoms, a group of formula II



(II)

in which R, R′, R_1, R'_1, X, X′ and n have the previously defined meaning, or a piperidine group of formula III



(III)

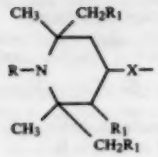
m can be equal to zero or 1;

Y, when m is zero, has the same meaning of A; when m is 1, can have the same meaning of A or represent the following groups

—CO—R_6—CO; —CO—NH—R_7—NH—CO, —COO—R_8—OOC—, —H_2C—R_9—CO—,

in which R_5 represents hydrogen, a straight-chain or branched alkyl radical having 1 to 18 carbon atoms, a cycloalkyl radical having 5 to 12 carbon atoms, an alkenyl radical having 3 to 18 carbon atoms, an optionally substituted aralkyl radical, having 7 to 19 carbon atoms, an aryl radical having 6 to 12 carbon atoms or the

O—R_{11}, S—R_{11} groups, in which R_{11} and R_{10} can be the same or different and represent hydrogen, a straight-chain or branched alkyl radical having 1 to 18 carbon atoms, a cycloalkyl radical having 5 to 12 carbon atoms, an aralkyl radical having 7 to 12 carbon atoms, an aryl radical having 6 to 12 carbon atoms, R_{11} and R_{10} together with the nitrogen atom can form a 5 to 7 membered heterocyclic ring; or R_5 represents the piperidine group of formula IV



(IV)

in which R, R_1 and X have the previously defined meaning;

R_6 represents a bivalent alkylene radical having 1 to 8 carbon atoms, the phenylene radical;

R_7 represents a bivalent alkylene radical having 2 to 6 carbon atoms, the tolylene radical, the xylene radical;

R_8 represents a bivalent alkylene radical having 2 to 8 carbon atoms;

R_9 represents an alkylene radical having 1 to 2 carbon atoms or a p-phenylene radical;

p can vary from 2 to 2000.

15. A method of stabilizing a polymer against the deteriorating effects of heat, sunlight and oxygen which comprises incorporating in the polymer an effective amount of a compound according to claim 1.

4,477,616

TETRA-(2,2,6,6-TETRAMETHYL-4-PIPERIDINYL)-3-METHYL-5-(1'2'-BISCARBOXYLATE)-ETHYL-CYCLOHEXANE OR 3-CYCLOHEXENE-1,2-DICARBOXYLATES AND SYNTHETIC RESIN COMPOSITIONS CONTAINING THE SAME

Motonobu Minagawa, Koshigaya; Yutaka Nakahara, Iwatsuki, and Toshihiro Shibata, Omiya, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

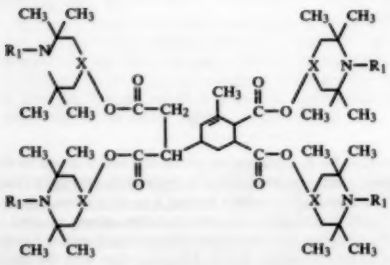
Filed Mar. 3, 1983, Ser. No. 471,913

Claims priority, application Japan, Mar. 9, 1982, 57-36796

Int. Cl.³ C08K *5/34;* **C07D** *401/00*

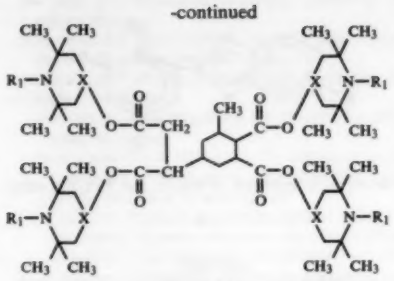
U.S. Cl. 524—102 **36 Claims**

1. Tetra-(2,2,6,6-tetramethyl-4-piperidinyl)-3-methyl-5-(1',2'-biscarboxylate)-ethyl-cyclohexane or 3-cyclohexene-1,2-dicarboxylates having the formula (I) or (II):



I

-continued



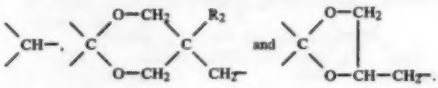
II

wherein:

R_1 is selected from the group consisting of hydrogen, —O, alkyl, hydroxy alkyl and epoxyalkyl having from one to about eighteen carbon atoms, acyl having from one to about eighteen carbon atoms, cycloalkyl having from three to about eighteen carbon atoms; phenyl; phenalkyl and alkylphenyl having from seven to about twenty-four carbon atoms;

R_2 is lower alkyl having from one to about six carbon atoms; and

X is selected from the group consisting of:



4,477,617

MOLDING RESINS BASED ON BLENDS OF ACID COPOLYMER/HYDROCARBON POLYOLEFIN/REINFORCING FIBER/WETTING AGENT

Charles V. Murphy, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Jul. 21, 1982, Ser. No. 400,244

Int. Cl.³ C08K *7/14, 3/40, 5/41, 5/09*

U.S. Cl. 524—136 **13 Claims**

1. A composition having improved toughness and flexibility consisting essentially of

(a) from about 5 to about 85 percent by weight of acid copolymer selected from the group consisting of direct copolymers and graft copolymers wherein,

(A) said direct copolymer is the copolymer of α-olefin having the formula $R—CH=CH_2$, where R is a radical selected from the class consisting of hydrogen and alkyl radicals having from 1 to 8 carbon atoms and α,β-ethylenically unsaturated caboxylic acids having from 3 to 8 carbon atoms, the acid moieties being randomly or nonrandomly distributed in the polymer chain,

(1) the α-olefin content of the copolymer being at least 25 weight percent, based on the α-olefin-acid copolymer,

(2) the unsaturated carboxylic acid content of the copolymer being from about 0.5 to about 50 weight percent, based on the α-olefin-acid copolymer, and

(3) any other monomer component optionally copolymerized in said copolymer being monoethylenically unsaturated, and

(B) said graft copolymer is obtained by grafting 0.1 to 5 percent by weight of α,β-unsaturated carboxylic acid having 3 to 8 carbon atoms or an unsaturated carboxylic

acid anhydride onto a preformed polyolefin backbone derived from ethylene or ethylene and C_3 to C_8 α-olefin, in which polyolefin backbone any other optionally copolymerized monomer component is monoethylenically unsaturated,

said direct or graft acid copolymers having from 0 to about 90 percent of the caboxylic acid groups ionized by neutralization with metal ions, said ionic copolymers having solid state properties characteristic of crosslinked polymers and melt-fabricability properties characteristic of uncrosslinked thermoplastic polymers,

(b) from about 10 to about 90 percent by weight of at least one hydrocarbon polyolefin selected from the group consisting of linear polymer of α-olefin having the formula $R—C{=}CH_2$, where R is a radical selected from the class consisting of hydrogen and alkyl radicals having from 1 to 8 carbon atoms; copolymer of ethylene and propylene where the ethylene content is up to about 20% by weight; linear copolymer of ethylene with at least one α-olefin comonomer having from 4 to 10 carbon atoms, where the α-olefin comonomer content is from about 2 to about 25 percent by weight; and low density branched homopolymer of ethylene;

(c) from about 5 to about 50 percent by weight of at least one reinforcing fiber selected from the group consisting of glass fiber and blends of glass fiber and mineral fiber, and

(d) from about 0.05 to about 5.0 percent by weight of at least one wetting agent selected from the group consisting of alkanol amides; betaine derivatives; block copolymers comprising a series of condensates of ethylene oxide with hydrophobic bases formed by condensing propylene oxide with propylene glycol; ethoxylated compounds comprising alcohols, alkyl phenols, amines and amides; sulfonated derivatives comprising alkyl sulfonates, aryl sulfonates, alkyl-aryl sulfonates, amine and amide sulfonates, olefin sulfonates, sulfosuccinates, sulfonated fatty acid esters, sulfonates of ethoxylated alkyl phenols and of oils and of fatty acids, naphthalene and alkyl naphthalene sulfonates, condensed naphthalene sulfonates, naphthalene and alkyl naphthalene sulfonates and petroleum sulfonates, and dodecyl and tridecyl benzene sulfonates; dodecyl and tridecyl sulfonic acids; sulfates of alcohols, of ethoxylated alcohols, of ethoxylated alkyl phenols, of oils, of fatty acids, of fatty esters, alkaryl sulfates, and sodium, ammonium and amine salts of alcohol sulfates; phosphate derivatives comprising phosphate esters, phosphate alcohol ethoxylates, phosphate ether ethoxylates, phosphate alkyl acids and phosphate alkyl quaternaries; quaternary surfactants; and liquid polyesters.

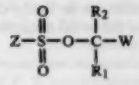
4,477,618

AMINOPLAST CURABLE COATING COMPOSITIONS CONTAINING SULFONIC ACID ESTERS AS LATENT ACID CATALYSTS

Debra L. Singer, Pittsburgh; Gregory J. McCollum, Glenshaw; Rostyslaw Dowbenko, Gibsonia; Roger M. Christenson, Gibsonia; Michael M. Chau, Gibsonia, and Wen-Hsuan Chang, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

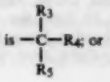
Filed Sep. 29, 1982, Ser. No. 427,402
Int. Cl.³ C08F *8/36*
U.S. Cl. 524—157 **20 Claims**

1. An organic solvent based coating composition having a total solids content of at least 50 percent and which is sprayable, said coating composition being capable of acid catalyzed crosslinking, comprising an active hydrogen-containing resin, a curing agent present externally and/or internally as a part of the active hydrogen-containing resin, and a catalytic amount of a non-ionic ester of a sulfonic acid, represented by the following structural formula:



wherein:

Z is a radical selected from the group consisting of amino and an organic radical, said organic radical being connected to the sulfur atom by a carbon atom;



C_3–C_{20} cycloalkyl; and

R_1 is hydrogen, carboalkoxy, C_3–C_{20} alkyl, C_6–C_{18} aryl, or C_3–C_{20} cycloalkyl;

R_2 is hydrogen, carboalkoxy, C_3–C_{20} alkyl, C_6–C_{18} aryl, or C_3–C_{20} cycloalkyl;

R_3 is hydrogen, carboalkoxy, acyloxy, N-alkylcarbamyloxy, N-arylcarbamyloxy, C_3–C_{20} alkyl, C_6–C_{18} aryl, or C_3–C_{20} cycloalkyl;

R_4 is hydrogen, carboalkoxy, acyloxy, N-alkylcarbamyloxy, N-arylcarbamyloxy, C_3–C_{20} alkyl, C_6–C_{18} aryl, or C_3–C_{20} cycloalkyl, and

R_5 is hydrogen, carboalkoxy, acyloxy, N-alkylcarbamyloxy, N-arylcarbamyloxy, C_3–C_{20} alkyl, C_6–C_{18} aryl, or C_3–C_{20} cycloalkyl.

4,477,619

PREPARATION OF FABRIC FOR BONDING TO RUBBER

Mary B. Lattimer, Hudson; Carl D. Weber, Copley, and Zbigniew R. Hardt, Akron, all of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 8, 1982, Ser. No. 433,490
Int. Cl.³ C08K *5/06, 5/41*
U.S. Cl. 524—171 **15 Claims**

1. An adhesive composition for coating a fabric or cord made from polyester or aramid fibers, in a first of plural baths, comprising,

an aqueous adhesive dispersion, having a viscosity of less than 25 cps, of

(a) a solid reversibly blocked polyisocyanate (RBP) formed by reversibly blocking a polyisocyanate with a blocking agent capable of an addition reaction with it, said RBP having a majority of primary particles less than 1 micron in average diameter, and,

(b) a hydrocarbyl disperser consisting essentially of a surfactant and a dispersing agent having essentially no surface active properties, said surfactant having plural aliphatic hydroxyl (OH) groups and less than 20 straight-chain carbon atoms, said disperser and RBP particles being present in an amount insufficient to increase the viscosity of said dispersion by more than 15%,

whereby said RBP is held in suspension in a substantially homogeneous dispersion with less agitation than is required to produce a vortex in said dispersion.

4,477,620

POLYIMIDE FILM

Darrell J. Parish, Stoutsville, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 2, 1984, Ser. No. 585,459
Int. Cl.³ C08K *3/30*
U.S. Cl. 524—423 **9 Claims**

1. A shaped article comprising a continuous matrix of polyimide and 0.1 to 10 weight percent of barium sulfate substan-

tially homogeneously distributed throughout the matrix wherein the barium sulfate is in finely divided form with an average particle size of 0.2 to 20 micrometers.

4,477,621

RUBBER COMPOSITIONS FOR TIRE CONTAINING A SPECIFIC CARBON BLACK

Susumu Sato, Tokyo; Masaru Onda, Akigawa, and Mikihiko Ikegami, Tokorozawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,453

Claims priority, application Japan, Jun. 25, 1982, 57-108379

Int. Cl.[3] C08K *3/04;* B60C *1/00*

U.S. Cl. 524—496 4 Claims

1. A rubber composition for use in tire, comprising 30 to 60 parts by weight, based on 100 parts by weight of diene rubber, of a carbon black having a nitrogen adsorption value (N_2SA) of 35 to 105 m^2/g, a DBP absorption value of 140 to 200 ml/100 g, a 24M4DBP absorption value of 60 to 120 ml/100 g and a ΔDBP of 50 to 110 ml/100 g defined by ΔDBP=DBP absorption value−24M4DBP absorption value.

4,477,622

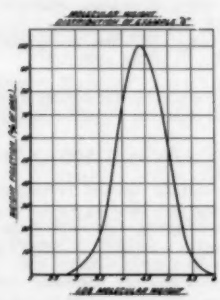
CONTACT ADHESIVES

F. Thomas. Sanderson, Warminster, and David R. Gehman, Harleysville, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 119,916, Feb. 8, 1980, abandoned. This application Sep. 11, 1981, Ser. No. 301,083

Int. Cl.[3] C08L *33/02*

U.S. Cl. 524—522 16 Claims



1. In an aqueous contact adhesive which dries to an essentially non-tacky state and adheres only to another dried, non-tacky layer of the adhesive upon contact, in the form of an aqueous latex of an addition polymer or polymer mixture at least predominantly of α,β-monoethylenically unsaturated monomers and containing a thickener and crosslinking means, the improvement in which the molecular weight of the polymer or polymer mixture is widely divergent and has a heterogeneity index, the ratio of M_w/M_n of from 15 to 150, a fraction of from about 5% to 70% of the polymer having an M_n of between about 500 and 100,000 and a fraction of from about 30% to 95% of the polymer having an M_n of between about 100,000 to at least 2,000,000, the molecular weights being determined by gel permeation chromatography, and the T_g of the polymer or polymer mixture is between 10° C. and −60° C. said contact adhesive, when dried to an essentially non-tacky state, adheres only to another dried, non-tacky layer of the adhesive upon contact.

4,477,623

PROCESS FOR THE PREPARATION OF POLYMER DISPERSIONS

Dick A. Pons, Maassluis, and Anno Bijker, Spijkenisse, both of Netherlands, assignors to Synres International B.V., Hoek Van Holland, Netherlands

Continuation-in-part of Ser. No. 356,066, Mar. 8, 1982, abandoned, which is a continuation of Ser. No. 249,872, Apr. 1, 1981, abandoned. This application Jan. 27, 1983, Ser. No. 461,493

Claims priority, application Netherlands, Apr. 2, 1980, 8001928

Int. Cl.[3] C08K *5/49*

U.S. Cl. 524—710 11 Claims

1. An aqueous paint composition, comprising at least one dispersed water-insoluble addition polymer and at least one alkali-soluble addition polymer, one or more pigments and conventional additives, wherein

A. said water-insoluble addition polymer is formed by copolymerizing, in water, at least one unsaturated monomer selected from the group consisting of styrene, acrylates, methacrylates, vinyl esters, and vinyl chloride,

said addition polymer further including, in an amount between 0.1 and 5.0 wt. % relative to the total amount of said unsaturated monomers, at least one monomer containing a phosphoric acid, sulphonic acid, or carboxylic acid group functioning as emulsifier, and in the presence of

(i) an effective initiator

(ii) at least one anionic or non-ionic emulsifier, and

(iii) at least one compound containing a polyoxyethylene chain having between 60 and 400 oxyethylene units, with said compound selected from the group consisting of

(a) polyethylene glycols present in an amount between 0.1 and 5.0 wt. % relative to the total quantity of said unsaturated monomers, and

(b) ethoxylated anionic and non-ionic emulsifiers containing said polyoxyethylene chain,

and

B. said alkali-soluble polymer is a copolymer consisting of acrylates or methacrylates and unsaturated mono- or dicarboxylic acid units, and is present in an amount of between 1 and 25 wt. % relative to the total amount of said addition polymers.

4,477,624

HEAT-RESISTANT SYNTHETIC RESIN COMPOSITION

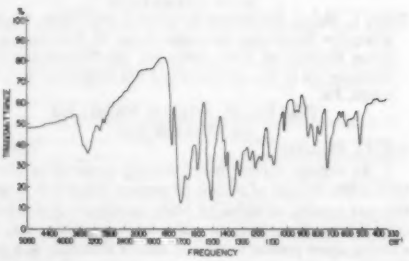
Misao Waki, Touic, Japan, assignor to Showa Electric Wire & Cable Co., Ltd., Kanagawa, Japan

Filed Sep. 29, 1982, Ser. No. 426,833

Claims priority, application Japan, Nov. 9, 1981, 56-178289; Dec. 3, 1981, 56-194733

Int. Cl.[3] C08G *18/34, 18/80;* C08K *5/13;* C08L *79/08*

U.S. Cl. 524—736 6 Claims



1. A heat-resistant synthetic resin composition, which comprises (A) 15 to 60% by weight of a film-forming synthetic

resin soluble in a phenolic solvent and (B) 85 to 40% by weight of a phenolic solvent, said film-forming synthetic resin containing at least 30% by weight of a polyamide imide resin derived from substantially equal molar amounts of (a) a tricarboxylic acid and/or an anhydride thereof containing at least 5 mol % of citric acid and (b) a diisocyanate and/or a derivative obtained by masking diisocyanate with a phenolic compound.

2. A heat-resistant synthetic resin composition according to claim 1, wherein the polyamide imide resin is prepared by reacting (a) a tricarboxylic acid and/or an anhydride thereof containing at least 5 mol % of citric acid with (b) a diisocyanate and/or derivative obtained by masking diisocyanate with a phenolic compound in (c) a phenolic solvent.

4,477,625
ONE PACKAGE, STABLE, MOISTURE CURABLE, ALKOXY-TERMINATED ORGANOPOLYSILOXANE COMPOSITIONS

Thomas P. Lockhart, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

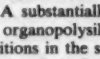
Filed Apr. 1, 1983, Ser. No. 481,528
Int. Cl.³ C08G *77/04*; C08K *3/34*; C08L *83/04*
U.S. Cl. 524—789 **13 Claims**

1. A substantially anhydrous, room temperature vulcanizable organopolysiloxane composition stable under ambient conditions in the substantial absence of moisture over an extended period of time and convertible to a substantially acid-free, tack-free elastomer comprising by weight,

(A) an organopolysiloxane wherein the silicon atom at each polymer chain end is terminated with at least one alkoxy radical,

(B) an effective amount of condensation catalyst

(C) from 0 to 0.1 part, per part of the alkoxy terminated organopolysiloxane of (A) of a cross-linking polyalkoxysilane of the formula



(D) from 1×10^{-5} to 0.10 part, per part of the alkoxy terminated organopolysiloxane of an organo nitrogen accelerator selected from the class consisting of di-t-butylethylenediamine and cyclic amidines having at least one chemically combined units of the formula,

where the free valences of such unit are satisfied by atoms selected from carbon, hydrogen, silicon and mixtures thereof,

(E) a stabilizing amount of a scavenger for hydroxy radicals selected from

(i) an organic material having at least one alcohol reactive functional groups which is suitable as a scavenger for hydroxy radicals and which has a molecular weight in the range of from about 40 to about 1,000 and consists essentially of a mixture of chemically combined atoms selected from C, H, N, O, P, S, Cl, F, Br and I and

(ii) a silicon containing scavenger for hydroxy radicals having a molecular weight in the range of from about 47 to about 5000 which contains a functional unit having the formula,

(iii) and a zeolite,

where X is a hydrolyzable leaving group R^1 is a $C_{(1-8)}$ aliphatic organic radical selected from alkyl radicals, alkylether radicals, alkylester radicals, alkylketone radicals and alkylcyano or a $C_{(7-13)}$ aralkyl radical, R^2 is a $C_{(1-13)}$ monovalent organic radical selected from R radicals as previously defined, a is a whole number equal to 0 to 2 inclusive, and d has a value of from 0 to 4 inclusive and the remaining valences of Si other than those satisfied by X can be satisfied by atoms selected from H, Si, C, O and P, S and transition elements IIIa–VIIa and VIII and mixtures thereof.

4,477,626
POLYORGANOSILOXANE COMPOSITIONS

Toshio Suzuki, Yushudainishi, Japan, assignor to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1984, Ser. No. 587,330
Claims priority, application Japan, Mar. 25, 1983, 58-50158
Int. Cl.³ C08L *83/04*
U.S. Cl. 524—862 **12 Claims**

1. A curable thixotropic, liquid polyorganosiloxane composition comprising the product obtained by mixing

(A) a polyorganosiloxane containing at least two vinyl radicals per molecule and represented by the average unit formula

$$R_aSiO_{(4-a)/2},$$

where at least 50 mole % of the radicals represented by R are methyl, the remainder being selected from the group consisting of unsubstituted monovalent hydrocarbon radicals other than methyl,alkoxy and substituted monovalent hydrocarbon radicals where the substituent is selected from the group consisting of acryloxy, methacryloxy, chlorine and fluorine, and the value of a is from 1.8 to 2.2, inclusive;

(B) a polyorganosiloxane containing at least two silicon-bonded nitrogen atoms per molecule and represented by the average unit formula

$$R_b^1SiO_{(4-b)/2},$$

where R^1 is selected from the group consisting of unsubstituted monovalent hydrocarbon radicals, hydrogen, alkoxy, and substituted monovalent hydrocarbon radicals wherein the substituent is selected from acryloxy, methacryloxy, chlorine, and fluorine, the value of b is from 1.5 to 2.5, inclusive, and the molar ratio of silicon-bonded hydrogen atoms in (B) to vinyl radicals in (A) is from 0.2 to 5, inclusive;

(C) an amount of a platinum-containing catalyst equivalent to from 0.1 to 200 parts by weight of platinum per million parts of combined weight of (A) and (B);

(D) from 0.5 to 50 weight %, based on the combined weight of (A) and (B), of fine silica powder; and

(E) from 0.05 to 10 weight %, based on the combined weight of ingredients (A) through (D), of a polyorganosiloxane containing at least 0.5 weight percent of hydroxyl groups per molecule and represented by the average unit formula

$$R_c^2SiO_{(4-c)/2},$$

where the value of c is from 1.8 to 3.0, R^2 is selected from the group consisting of monovalent hydrocarbon radicals, methoxy, ethoxy, substituted alkyl radicals wherein the substituent is, in turn, selected from the group consisting of chlorine, fluorine, and hydroxyl, and radicals of the formula

$$-R^3(OC_2H_4)_x(OC_3H_6)_yOH,$$

where R^3 is alkylene, and the values of x and y are from 0 to 30, inclusive, with the proviso that the sum of x and y is at least 1, and that (E) contains a number of silicon-bonded hydroxyl groups sufficient to provide a total of at least 0.5 percent by weight of hydroxyl groups per molecule of (E) in combination with any hydroxyl groups present in R^2;

wherein said composition cures to form a gel exhibiting a penetration of from 8 to 50 mm.

4,477,627

GEL IMPACT MODIFIED POLYCARBONATE RESIN COMPOSITIONS

William R. Haaf, Voorheesville; Gim F. Lee, Jr., Albany, both of N.Y., and Glenn D. Cooper, deceased, late of Delmar, NY (by Rose H. Cooper, executrix), assignors to General Electric Company, Mt. Vernon, Ind.

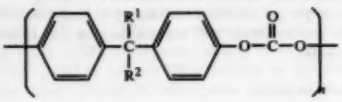
Filed Oct. 27, 1983, Ser. No. 545,885

Int. Cl.³ C08L *69/00*

U.S. Cl. 525—67 **17 Claims**

1. A thermoplastic molding composition comprising

(a) an aromatic polycarbonate resin having repeating units of the formula



in which R^1 and R^2 are independently selected from the group consisting of hydrogen, (lower) alkyl of from 1 to about 6 carbon atoms, halogen substituted (lower) alkyl and phenyl, and n represents the total number of monomer units and is at least about 30 the polycarbonate resin of the said composition having virtually no o, o, o′, o′-tetraalkyl substituted aromatic units; and

(b) an Izod impact improving effective amount of a gel material in the form of rubbery particles comprising rubber, rubber grafted alkenyl aromatic resin and occluded alkenyl aromatic resin, the gel material being substantially devoid of solvent extractable alkenyl aromatic homopolymer.

4,477,628

COMPOSITION WITH IMPROVED POT LIFE

Yasushi Kato, and Hisao Furukawa, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 306,829, Oct. 3, 1981, abandoned. This application Aug. 5, 1982, Ser. No. 405,334

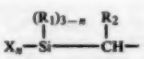
Claims priority, application Japan, Oct. 3, 1980, 55-139086

The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.

Int. Cl.³ C08F *8/00*

U.S. Cl. 525—100 **6 Claims**

1. A composition consisting essentially of a mixture of 0.01 to 10 parts by weight of a hardening catalyst and 100 parts by weight of a vinyl resin containing at least one silyl radical coupled with a hydrolytic radical at end groups or in side chains of each molecule, said silyl radical represented by the formula:



wherein X represents a hydrolytic radical, R_1 and R_2 represent hydrogen atom, alkyl, aryl, or aralkyl radicals, any of which has 1 to 10 carbon atoms, and n is an integer of 1,2 or 3, said hydrolytic radical being selected from the group consisting of halogen, alkoxy, acryloxy, ketoximato, amino, acid amide, aminoxy, mercapto, and alkenyloxy radicals; and

wherein said viny resin containing silyl group is produced by copolymerization reaction of one or more vinyl compounds to produce a vinyl resin having a carbon double bond followed by hydrosilylation reaction with hydrosilane, or copolymerization of said one or more vinyl compounds with silane compound having a double bond capable of polymerization, wherein said one or more vinyl compounds is selected from the group consisting of acrylic or methacrylic esters, carboxylic acids, acid anhydrides, epoxy compounds, amino compounds, acrylonitrile, iminolmethacrylate styrene, alpha methyl styrene, vinyl chloride, vinyl acetate, and vinyl propionate; and

wherein said hardening catalyst comprises a mercaptide organic tin compound having Sn—S bond, or a sulfide organic tin compound having Sn=S bond, selected from the group consisting of

$(n\text{—}C_4H_9)_2Sn(SCH_2COO)$

$(n\text{—}C_8H_{17})_2Sn(SCH_2CH_2COO)$

$(n\text{—}C_8H_{17})_2Sn(SCH_2COOCH_2CH_2OCOCH_2S)$

$(n\text{—}C_8H_{17})_2Sn(SCH_2COOCH_2CH_2CH_2CH_2OCOCH_2S)$

$(n\text{—}C_4H_9)_2Sn(SCH_2COOC_8H_{17\text{-}iso})_2$

$(n\text{—}C_4H_9)_2Sn(SCH_2COOC_{12}H_{25\text{-}n})_2$

$(n\text{—}C_4H_9)_2Sn(SCH_2COOC_8H_{17\text{-}iso})_3$, and

$(n\text{—}C_8H_{17})_2Sn{=}S$;

wherein said carboxylic acid is selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, and fumeric acid; wherein said acid anhydride is maleic acid anhydride; wherein said epoxy compound is selected from the group consisting of glycidyl acrylate and glycidyl methacrylate; and wherein said amino compound is selected from the group consisting of diethylamino ethyl acrylate, diethylaminoethyl methacrylate, and amino ethyl vinylether; and wherein said acrylic or methacrylic ester is selected from the group consisting of methyl acrylate, methyl methacrylate, ethyl acrylate, ethyl methacrylate, butyl acrylate, butyl methacrylate, 2-ethylhexyl acrylate, and 2-ethylhexyl methacrylate;

whereby pot life of said mixture is substantially lengthened.

4,477,629

CYANATE-CONTAINING POLYMERS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

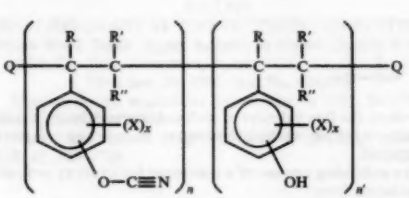
Filed Jul. 27, 1983, Ser. No. 517,861

Int. Cl.³ C07C *122/00;* **C08G** *61/02;* **C08L** *65/00, 63/00*

U.S. Cl. 525—113 **8 Claims**

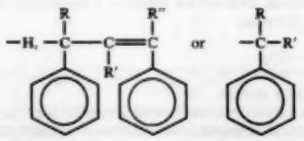
1. A composition which comprises

(A) from about 1 to 100 percent by weight (pbw) of a cyanate-containing polymer or mixture of cyanate-containing polymers represented by the formula:



I

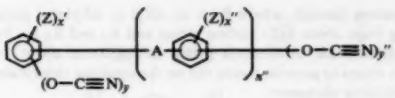
wherein each R, R′ and R″ is independently hydrogen or an alkyl group having from 1 to about 4 carbon atoms; each X is independently an alkyl group having from 1 to about 4 carbon atoms, chlorine or bromine; Q is independently a group derived from any suitable polymerization initiator or terminator,



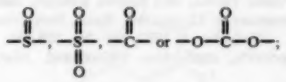
wherein each aromatic ring may contain any substituent group as those enumerated in formula I and each R, R′ and R″ is defined as in formula I; n has a value from about 5 to about 100; n′ has a value from zero to about 99; and each x independently has a value from zero to 4; and

(B) from zero to about 99 pbw of an aromatic polycyanate or mixture of aromatic polycyanates represented by the formula:

II



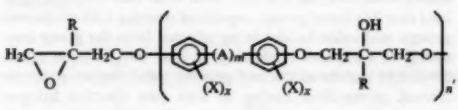
wherein each Z is independently H-, an alkyl group having from 1 to about 4 carbon atoms, chlorine or bromine; A is a direct bond, a hydrocarbyl group having from 1 to about 10 carbon atoms, —S—, —S—S—, —O—,

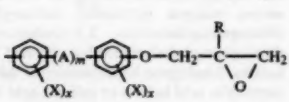


y has a value from zero to 5 when n″ has a value of 1; y has a value from 2 to 5 when n″ has a value of zero; x′ has a value of 5 minus the value of y when n″ has a value of 1; x′ has a value of 6 minus the values of y plus y″ when n″ has a value of zero; x″ has a value of 5 minus the value of y″; y″ has a value of zero to 5; n″ has a value of zero to 3; with the proviso that the sum of y and y″ is always at least two; and

(C) from zero to about 99 pbw of an epoxy resin or mixture of epoxy resins represented by the formulas:

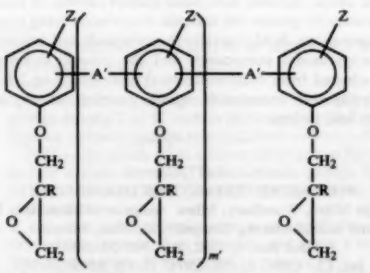
III



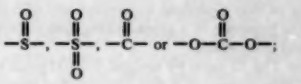


or

IV



wherein R, X, Z, n′, and x are as defined above; m′ has a value of 0.01 to about 10, and each A is independently a hydrocarbyl group having from 1 to about 10 carbon atoms, —S—, —S—S—, —O—,



each A′ is independently a hydrocarbyl group having from 1 to about 10 carbon atoms; each m has a value of zero or 1; wherein the pbw of the individual components is based upon the total weight of components A, B and C.

4,477,630

AROMATIC POLYSULFONE RESIN COMPOSITION SUITABLE FOR USE IN SELF-LUBRICATING MOLDING COMPOSITIONS

Teruo Saito, Kusatsu; Kuniaki Asai, Tondabayashi; Isamu Nakagawa, Osaka, and Tadayasu Kobayashi, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 9, 1983, Ser. No. 473,459

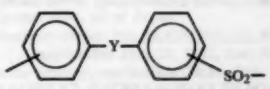
Claims priority, application Japan, Mar. 16, 1982, 57-42282

Int. Cl.³ C08L *27/12, 27/18, 67/00, 81/06*

U.S. Cl. 525—133 **8 Claims**

1. A resin composition which is excellent in sliding characteristics, consisting essentially of

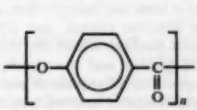
(1) 30–95% by weight of a thermoplastic aromatic polysulfone having a repeating unit represented by the following structure



wherein Y is an oxygen atom, a sulfur atom or a residue of an aromatic diol;

(2) 2.5–60% by weight of a fluorocarbon polymer selected from the group consisting of a polytetrafluoroethylene, a polytetrafluoroethylene-hexafluoropropylene copolymer, a polytrichlorofluoroethylene and a tetrafluoroethyleneperfluoroalkylvinyl ether copolymer; and

(3) 2.5–60% by weight of an oxybenzoyl polyester having a repeating unit represented by the following structure



wherein n is an integer from 3 to 600 and wherein the total amount of the fluorocarbon polymer (2) and the oxybenzoyl polyester (3) is in the range of from 5 to 70% by weight.

4,477,631

PROCESS FOR PREPARING POLYOLEFINIC ELASTOMERIC COMPOSITIONS BY DYNAMIC VULCANIZAION

Sergio Danesi; Sergio Forti, and Michele Manica, all of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 408,691, Aug. 16, 1982, abandoned, which is a continuation of Ser. No. 293,247, Aug. 17, 1981, abandoned. This application Dec. 19, 1983, Ser. No. 563,174

Claims priority, application Italy, Aug. 19, 1980, 24213 A/80

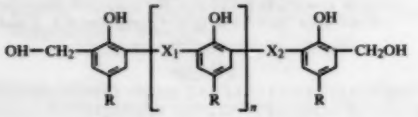
Int. Cl.³ C08L *61/10*

U.S. Cl. 525—133 **5 Claims**

1. Process for the preparation of plasto-elastomeric compositions, consisting in subjecting to mastication a mix consisting of 20% to 60% by weight of an olefinic polymer, and from 80%

to 40% by weight of an unsaturated elastomeric terpolymer consisting of two α-olefinic monomers and of a dienic monomer, in the presence of a cross-linking system free of halogen donors and comprising:

(a) from 1 to 10 parts by weight, for 100 parts by weight of said terpolymer, of a non-halogenated phenolic resin of the following general formula:



wherein:

X_1, X_2, the same or different, are $-CH_2-$ or $-CH_2-O-CH_2-$ radicals;

R is an alkyl, aryl or alkenyl radical containing from 4 to 16 carbon atoms;

n is an integer comprised between 0 and 6, extremes excluded; and

(b) a metal compound selected from zinc oxide, magnesium oxide, iron oxide, titanium dioxide, calcium oxide, aluminum, silicon and calcium carbonate oxides, in a ponderal ratio with the phenolic resin comprised between 3 and 5;

at a temperature sufficient to melt said olefinic polymer and for a time sufficient for obtaining a homogeneous mixture, and by then continuing the mastication at a temperature at which there occurs at least a partial cross-linking of the elastomeric terpolymer.

4,477,632

FLAME RETARDANT COPOLYESTER-CARBONATE COMPOSITIONS

Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Aug. 1, 1983, Ser. No. 519,485

Int. Cl.³ C08L *67/02, 69/00*

U.S. Cl. 525—147 **19 Claims**

1. Fire retardant and substantially non-dripping copolyester-carbonate compositions consisting essentially of, in admixture

(i) at least one halogen-free sulfur containing copolyester-carbonate resin comprised of the reaction products of (a) a carbonate precursor, (b) at least one halogen-free, sulfur-free and non polycyclic dihydric phenol, and (c) from about 1 to about 15 mole percent, based on the total amounts of said dihydric phenol and the thiodiphenol used, of at least one halogen-free thiodiphenol, and (d) at least one difunctional carboxylic acid or a reactive derivative thereof; and

(ii) from about 0.01 to about 1 weight percent, based on the amount of said copolyester-carbonate resin, of at least one fluorinated polyolefin.

4,477,633

SIMULTANEOUSLY CHLORINATING AND GRAFTING A CURE SITE ONTO POLYETHYLENE IN AN AQUEOUS SUSPENSION

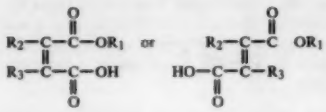
Robert L. Dawson, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Dec. 15, 1983, Ser. No. 561,523

Int. Cl.³ C08F *8/46*

U.S. Cl. 525—292 **9 Claims**

1. A process for preparing a curable chlorinated polyethylene elastomer which comprises mixing finely divided polyethylene with water sufficient to form an aqueous suspension of the polyethylene and simultaneously chlorinating the polyethylene and grafting a cure site onto the polyethylene backbone by mixing and heating the aqueous suspension containing a free radical initiator, gaseous chlorine and about 0.1–1.5 moles per kg of polyethylene of an alkyl or alkylaryl monoester of butenedioic acid having the formulas



or mixtures thereof, where R_1 is an alkyl or alkylaryl group having from about 8–20 carbon atoms and R_2 and R_3 are hydrogen, chlorine or an alkyl group having from about 1–4 carbon atoms to provide a cure site on the resulting chlorinated polyethylene elastomer.

4,477,634

MODIFIED ACRYLONITRILE POLYMER CONTAINING SEMIPERMEABLE MEMBRANES

Charles Linder, Rehovot; Gershon Aviv, Tel Aviv; Mordechai Perry, Petach Tikvah, and Reuven Kotraro, Rehovot, all of Israel, assignors to Aligena AG, Basel, Switzerland

Filed Mar. 8, 1982, Ser. No. 355,656

Claims priority, application Switzerland, Mar. 25, 1981, 2030/81

Int. Cl.³ C08F *8/34, 8/30*

U.S. Cl. 525—327.1 **10 Claims**

1. A semipermeable membrane of an acrylonitrile polymer which is either polyacrylonitrile or a copolymer of acrylonitrile with an ethylenically unsaturated monomer selected from the group consisting of vinyl acetate, a vinyl ether, vinyl pyridine, vinyl chloride, styrene, butadiene, (meth)acrylic acid or a (meth)acrylate, maleic anhydride, 2-aminoethyl methacrylate, an allyl compound, or terpolymers or tetrapolymers based on acrylonitrile, or mixtures thereof wherein the acrylonitrile content of the copolymer, terpolymer or terapolymer is at least 5% by weight, said polymer having been chemically modified by reaction with (a) hydroxylamine and (b) a polyfunctional ionic colourless cyclic carbonic acid imide halide containing at least two functional groups capable of reacting with amidoxine groups, said imide halides being selected from the group consisting of s-triazines containing at least two halogen atoms bonded to carbon atoms and primary condensation products thereof, pyrimidines having at least two reactive halogen atoms, halogen pyrimidine carboxylic acid halides, 2,3-dihalogenoquinoxaline-, 2,3-dihalogeno-quinazoline or 2,3-dihalogeno-phthalazinecarboxylic acid halides or sulfonic acid halides, 2-halogeno benzthiazole- or 2-halogenobenzooxazole-carboxylic acid halides or sulfonic acid halides and halogeno-6-pyridazonyl-1-alkanoyl halides and halogeno-6-pyridazonyl-1-benzoyl halides or a combination of polyfunctional anionic and cationic cyclic carbonic acid imide halides capable of reacting with amidoxine groups the cationic compounds being selected from ammonium dichlorotriazinyl compounds and ammonium trichloropyrimidyl compounds and the anionic compounds being selected from dichlorotriazinyl compounds or 2,4,5-trichloropyrimidyl compounds which contain carboxylic or sulfonic acid groups.

4,477,635

POLYMERIC TRIARYLMETHANE DYES

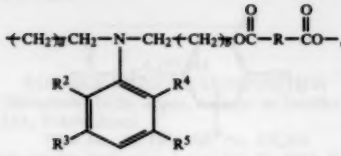
Smarajit Mitra, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

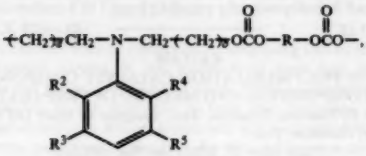
Filed Jan. 4, 1982, Ser. No. 336,637

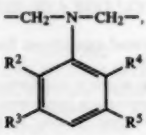
Int. Cl.³ C08G *63/08;* **C07C** *15/16;* **B32B** *27/00*

U.S. Cl. 525—437 **14 Claims**

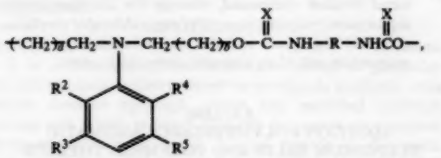
1. A polymeric aminotriarylmethane dye having a polyester, polycarbonate, polyethyleneimine or polyurethane backbone, said dye comprising repeating units selected from the group consisting of



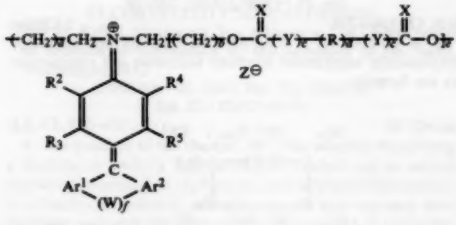




and



wherein R, R^2, R^3, R^4, R^5, X, a, and b are as defined below, and said dye having at least one arylamino unit of the general formula:



wherein

a and b are independently zero or an integer of 1 to 3;

X is oxygen or sulfur;

Y is oxygen or —NH—;

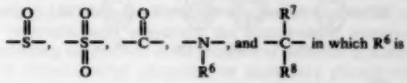
R is a divalent organic group selected from (1) aliphatic groups having 2 to 12 carbon atoms and up to 2 non-contiguous catenary groups selected from —O—, —S—, and $—NR^1—$, in which R^1 is a lower alkyl group having one to four carbon atoms, (2) cycloaliphatic groups having 5 12 carbon atoms, and (3) arylene groups having 6 to 12 carbon atoms;

c, d, and e are independently zero or one, with the provisos that when e is zero, then a is zero, and when c is zero or Y is oxygen, then X is oxygen;

R^2, R^3, R^4, and R^5 are independently hydrogen, and auxochromic group, a bathochromic group or R^2 and R^3 or R^4 and R^5 together are a benzo group;

Ar^1 and Ar^2 are independently aromatic groups having one or two 5- or 6-atom rings with conjugated unsaturation, the 5-atom rings having four carbon atoms and one of oxygen, sulfur, or nitrogen or three carbon atoms, one nitrogen, and one of oxygen or sulfur in the 1,3-position or nitrogen in the 1,2- or 1,3-position, the 6-atom rings having six carbon atoms or five carbon atoms and one nitrogen, or four carbon atoms and two nitrogens in the 1,2-1,3-, or 1,4-position or three carbon atoms and three nitrogens in the 1,3,5-position; and

W is a divalent group selected from the group consisting of a coordinate bond, —O—, —S—,



hydrogen or lower alkyl group having one to four atoms and R^7 and R^8 are independently hydrogen or a lower alkyl group having one to four carbon atoms;

f is zero or one; and

$Z^{\ominus}$ is an anion.

4,477,636

HOT-MELT ADHESIVE AND METHOD

Soichi Muroi, No. 651-50, Higashibara, Numazu-shi, Shizuoka-ken; Shigetoshi Seta, No. 3-4, Todoroki 8-chome, Setagaya-ku, Tokyo; Yoshio Matsumoto, No. 225, Mizushiri-cho, Nobeoka-shi, Miyazaki-ken; Koichi Yasui, No. 2-4901, Nakagawara-cho, Nobeoka-shi, Miyazaki-ken, and Kazuyoshi Imamura, No. 3-1, Nakagawara-cho 2-chome, Nobeoka-shi, Miyazaki-ken, all of Japan

Continuation of Ser. No. 11,648, Feb. 12, 1979, abandoned. This application Jun. 28, 1982, Ser. No. 392,699

Claims priority, application Japan, Feb. 13, 1978, 53-14122

Int. Cl.³ C08L *67/02, 67/06*

U.S. Cl. 525—444 **33 Claims**

1. A hot-melt adhesive comprising: a self-curing unsaturated polyester resin having a softening point of 45° to 200° C., one or more air-drying functional groups, an average polymerization degree of 8 or more and one or more double bonds originating from an α,β-unsaturated dicarboxylic acid; and a thermoplastic saturated polyester resin, said adhesive being capable of performing bonding-curing under heat and pressure, and wherein a vinyl monomer is not contained.

4,477,637

FLAME RETARDANT ALKYLATED POLYCARBONATE COMPOSITIONS

Sivaram Krishnan, Moers, Fed. Rep. of Germany, assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

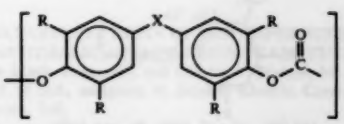
Filed Aug. 27, 1980, Ser. No. 181,915

Int. Cl.³ C08G *63/76*

U.S. Cl. 525—469 **5 Claims**

1. A flame resistant polycarbonate blend comprising:

(i) a polycarbonate resin characterized by the repeating unit



(I)

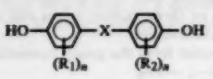
wherein

X denotes a single bond, an alkylene or an alkylidene group having 1 to 5 carbon atoms, a cycloalkylene or cycloalkylidene radical with 5 to 15 carbon atoms, an ether bond or a keto bond,

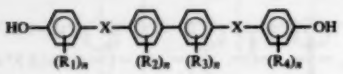
R denotes $—CH_3$, $—C_2H_5$ or $—CH(CH_3)_2$; and

(ii) a sulfur-bearing copolycarbonate, based on the reaction

product of a carbonic acid derivative and a mixture of a sulfur-free aromatic diphenol and a sulfur-bearing diphenol selected from a group consisting of

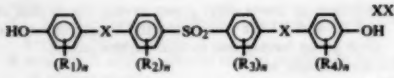


XXII



XXIII

and



XXIV

wherein

X is either S, SO, or SO_2,

R_1 to R_4 independently are H, Cl, Br and C_1 to C_4 alkyl, and

n is from 0 to 2

said blend characterized in exhibiting flame resistance classified V-O by the UL-94 test at $\frac{1}{8}$" in the absence of any other flame retardant.

4,477,638

HINDERED PHENOLIC ESTERS OF OLIGOMERIC GLYCOLS AS CHAIN TERMINATORS FOR POLYVINYL CHLORIDE POLYMERIZATION

William J. Reid, New Fairfield, Conn., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 280,389, Jul. 6, 1981, abandoned. This application Apr. 11, 1983, Ser. No. 482,016

Int. Cl.³ C08F *2/38, 2/42*

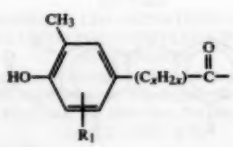
U.S. Cl. 526—84 **9 Claims**

1. In the process for the suspension polymerization of vinyl chloride monomer which comprises adding the monomer to an aqueous reaction system containing effective amounts of a suspending agent and a polymerization initiator, terminating the polymerization reaction and isolating the polyvinyl chloride, the improvement which comprises terminating the polymerization reaction by the addition to the reaction system at a point within the range of 70 to 95% monomer conversion of 25–5000 ppm by weight of the vinyl chloride monomer, of a compound corresponding to the formula

(II)

wherein

R is



X is oxygen,

b is an integer from 2 to 6,

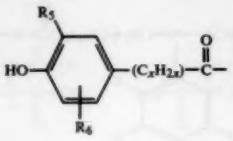
x is an integer from 0 to 6,

d is an integer from 3 to 40,

Y is oxygen,

R_1 is alkyl from 1 to 8 carbon atoms,

R_7 is hydrogen, lower alkyl or



R_5 and R_6 independently are alkyl from 1 to 8 carbon atoms.

4,477,639

OLEFIN POLYMERIZATION CATALYST COMPONENT AND COMPOSITION AND METHOD OF PREPARATION

Robert P. Nielsen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 27, 1983, Ser. No. 499,012

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—124 **10 Claims**

1. A polymer-supported constituent for olefin polymerization catalysts obtained by:

(a) mixing in organic solution a chlorine-containing organic polymer and a magnesium compound,

(b) removing the organic solvent to form a magnesium-modified polymer,

(c) reacting the magnesium-modified polymer with a halogenated titanium compound, wherein the chlorine-containing organic polymer is a poly(vinyl chloride/vinylidene chloride) copolymer and the magnesium compound is a magnesium salt of an aromatic carboxylic acid.

4,477,640

ADDITION POLYMERIZABLE AROMATIC SULFONIUM SALTS AND POLYMERS THEREOF

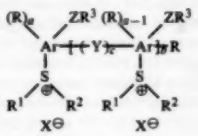
Donald L. Schmidt; Thomas C. Klingler, and Ritchie A. Wessling, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 164,744, Jun. 30, 1980,. This application Sep. 24, 1982, Ser. No. 422,775

Int. Cl.³ C08F *228/00, 220/38*

U.S. Cl. 526—256 **7 Claims**

1. A polymer of a water-soluble, addition polymerizable ethylenically unsaturated aromatic sulfonium salt represented by the formula:



I

wherein each Ar is individually a cyclic aromatic polyyl, each R is independently a suitably inert monovalent moiety capable of existing as a substituent on Ar, each R^1 and each R^2 are individually suitably inert monovalent organic moieties and/or each R^1 and R^2 are collectively a suitably inert divalent organic moiety which forms a heterocyclic ring with

each R^3 is individually an ethylenically unsaturated monovalent organic radical which is capable of undergoing addition polymerization, each Y is individually a suitably inert divalent radical capable of bridging aromatic moieties, each Z is individually a divalent sulfur or divalent oxygen, each $X^{\ominus}$ is a suitably inert anion, a is a positive number corresponding to the

number of remaining available ring positions on Ar, b is 0, 1 or 2, and c is 0 or 1.

4,477,641

CURABLE SILICONE COMPOSITION

Yasuji Matsumoto, Nitta, Japan, assignor to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1984, Ser. No. 574,804
Claims priority, application Japan, Feb. 21, 1983, 58-26284
Int. Cl.³ C08G 77/06
U.S. Cl. 528—15 11 Claims

1. A curable silicone composition comprising (A) an organopolysiloxane having in the molecule at least two alkenyl groups and at least two alkoxy groups, (B) an organopolysiloxane having in the molecule at least two hydrogen atoms bonded directly to silicon atoms and (C) a catalyst based on platinum, palladium or rhodium for the addition reaction.

4,477,642

SELFCROSSLINKING HEAT-HARDENABLE BINDER

Michael Geist, Münster, and Horst Diefenbach, Nottuln, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Filed Aug. 24, 1983, Ser. No. 526,071
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1982, 3233140
Int. Cl.³ C08G 18/34
U.S. Cl. 528—61 16 Claims

1. A selfcrosslinking heat-hardenable binder, in particular for electropaints, which is based on an organic synthetic resin which contains hydroxyl groups and esterified carboxyl groups and which is water-dilutable by partial or complete acid-neutralization of amino groups present in the resin, wherein the esterified carboxyl groups are carbalkoxymethyl ester groups.

4,477,643

FLUORINATED POLYURETHANES

Teddy M. Keller, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 20, 1984, Ser. No. 602,256
Int. Cl.³ C08G 18/38
U.S. Cl. 528—70 20 Claims

1. The product of the reaction of a first reactant comprising a fluorinated tertiary polyfunctional alcohol and a second reactant comprising an aliphatic or cycloaliphatic diisocyanate or a biuret derivative of said diisocyanate, said reactants having been reacted in the neat state in the presence of a polyurethane-forming catalyst.

4,477,644

REACTION INJECTION MOLDED POLYURETHANES EMPLOYING THIAPOLYCYCLIC POLYAHLS AS CHAIN EXTENDERS

Tonja R. Sutton, and David W. Hughes, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 8, 1983, Ser. No. 520,980
Int. Cl.³ C08G 18/14, 18/00
U.S. Cl. 528—73 20 Claims

1. A reaction injection molding composition comprising a non-thiacyclic polyahl, thiapolycyclic polyahl, an organic polyisocyanate and a urethane catalyst in proportions such that, upon subjecting the composition to conditions of a reaction injection molding process, a useful reaction injection molded article is formed.

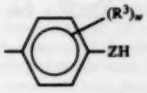
4,477,645

IMMOBILIZED EPOXY ADVANCEMENT INITIATORS

George A. Doorakian, Bedford, and Joseph W. Hanafin, Framingham, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 21, 1983, Ser. No. 515,824
Int. Cl.³ C08G 59/42, 59/62, 59/68
U.S. Cl. 528—99 9 Claims

1. In a process for reacting at an elevated temperature (a) an epoxy resin or thioepoxide bearing an average of more than one vicinal epoxide or thioepoxide group per molecule with (b) a polyhydric phenol, polyhydric thiophenol, carboxylic acid or carboxylic acid anhydride, the improvement comprising conducting the reaction in the presence of sufficient quantity of (c) a trihydrocarbyl phosphine or quaternary phosphonium cation which bear on the averge per molecule more than one moiety corresponding to the formula



wherein Z is —O— or —S—, R^3 at each occurrence is independently a moiety essentially inert in this process and w is an integer from 0 to 4, so as to promote the reaction of (a) with (b) and (c).

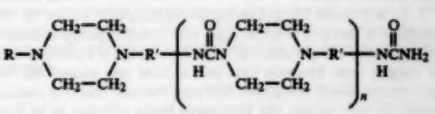
4,477,646

PIPERAZINOETHYL UREAS

Jimmy Myers, Sweeny, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 24, 1983, Ser. No. 525,866
Int. Cl.³ C08G 59/50; C07D 241/04
U.S. Cl. 528—118 17 Claims

1. A compound or mixture of compounds represented by the general formula



wherein R is hydrogen or a hydrocarbyl group having from 1 to about 12 carbon atoms, R' is a divalent hydrocarbyl group having from 1 to about 12 carbon atoms and n has an average value of from zero to about 30.

4,477,647

POLYARYLATE RESIN OF THIODIPHENOLS AND ISOPHTHALIC ACID OR DERIVATIVES THEREOF

Victor Mark, Evansville, and Charles V. Hodges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Aug. 30, 1983, Ser. No. 527,743
Int. Cl.³ C08G 63/68
U.S. Cl. 528—176 6 Claims

1. A polyarylate resin exhibiting flame retardancy "consisting essentially of the reaction products of"

(i) isophthalic acid or an ester forming reactive derivative thereof; and

(ii) at least one thiodiphenol.

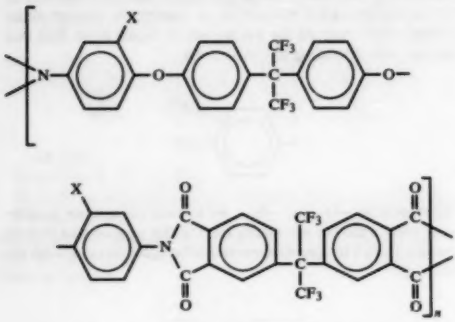
4,477,648

HIGH-TEMPERATURE POLYIMIDES PREPARED FROM 2,2-BIS-[(2-HALO-4-AMINOPHENOXY)-PHENYL]HEXAFLUOROPROPANE

Robert J. Jones, Hermosa Beach, and Glenn E. C. Chang, Redondo Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Apr. 7, 1983, Ser. No. 483,024
Int. Cl.³ C08G 73/10
U.S. Cl. 528—185 2 Claims

1. Polyimide copolymers having groups of the structure:



wherein X is a halogen and n is the number of repeating units in series.

4,477,649

TWO-STAGE CONTINUOUS PROCESS FOR PREPARATION OF POLYPHENYLENE OXIDES

David P. Mobley, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 25, 1983, Ser. No. 479,066
Int. Cl.³ C08G 65/44
U.S. Cl. 528—212 26 Claims

1. In a process for preparing polyphenylene oxides by the reaction of oxygen with at least one monohydroxy aromatic compound in the presence of a catalyst which is a combination of copper ions, bromide ions and at least one amine, the improvement which comprises carrying out said reaction continuously in two stages, the first stage being effected in at least one tank reactor and the second stage in a reaction system with limited back-mixing.

4,477,650

PROCESS FOR POLYPHENYLENE OXIDE PREPARATION INCLUDING CATALYST PRE-MIXING

David P. Mobley, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 25, 1983, Ser. No. 479,057
Int. Cl.³ C08G 65/44
U.S. Cl. 528—215 15 Claims

1. A process for maximizing catalyst activity in the preparation of a polyphenylene oxide by the reaction of oxygen with at least one monohydroxy aromatic compound in the presence of a copper-halide-amine catalyst in which the amine constituents comprise at least one secondary alkylene diamine and at least one tertiary monoamine;

said process comprising initially preparing a homogeneous blend comprising said monohydroxy aromatic compound and the catalyst reagents in an inert atmosphere, said monohydroxy aromatic compound comprising 5–60% by weight of said blend, and subsequently contacting said blend with oxygen to produce said polyphenylene oxide.

4,477,651

PROCESS FOR PREPARING POLYPHENYLENE OXIDES

Dwain M. White, Schenectady, and Susan A. Nye, Feura Bush, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 6, 1983, Ser. No. 501,477
Int. Cl.³ C08G 65/44
U.S. Cl. 528—215 20 Claims

1. The process for forming polyphenylene ether resin comprising the steps of:

(a) contacting a 2,6-di-substituted phenolic compound with an oxygen-containing gas in the presence of a catalyst, said catalyst comprising a copper compound, a diamine of the formula:

$$R^1HN—R^2—NHR^1$$

wherein each R^1 is independently isopropyl, a C_{4-8} tertiary alkyl or cycloalkyl group having no hydrogens on the alphacarbon atom and R^2 is C_{2-4} alkylene or C_{3-7} cycloalkylene; a tertiary amine; a bromine-containing compound selected from the group consisting of hydrogen bromide, alkali metal bromides, alkaline earth metal bromides, 4-bromophenols and mixtures thereof and an amount of dimethylamine, said amount of dimethylamine expressed as the molar ratio of dimethylamine to phenolic compound being in the range of from about 0.001:1 to about 0.01:1,

(b) permitting the resulting reaction to proceed for sufficient time to produce polyphenylene ether of at least about 45,000 molecular weight, and

(c) recovering said polyphenylene ether.

4,477,652

CONDENSATION POLYMERS OF CYCLIC DIOLS WITH ALDEHYDES OR ACETALS OF ALDEHYDES

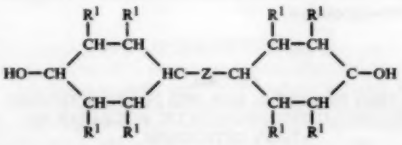
H. Wayne Hill, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 26, 1983, Ser. No. 526,577
Int. Cl.³ C08G 4/00, 8/10
U.S. Cl. 528—232 24 Claims

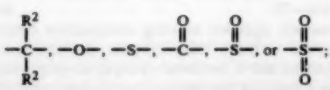
1. A process of preparing a condensation polymer by reacting effective ratios of:

(A) at least one cyclic diol, with at least one reactant selected from the group consisting of (B_1) diethers and (B_2) aldehydes, employing (D) an acidic catalyst under effective reaction conditions;

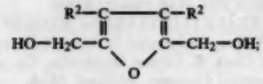
wherein said (A) cyclic diol is selected from the group consisting of:



wherein each R^1 is independently selected from H and CH_3; Z is a single covalent bond,

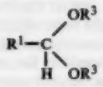


and each R^2 is independently selected from H, CH_3, and C_2H_5; and



(A2)

wherein said (B_1) diether reactant is represented by the formula:

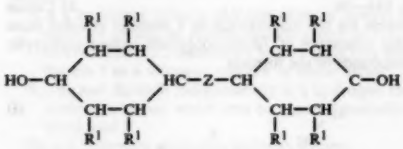


wherein each R^3 is individually selected from alkyl radicals of 1 to 5 carbon atoms, and said aldehyde (B_2) reactant is selected from the group consisting of formaldehyde; polymeric forms of formaldehyde including cyclic trioxymethylene, cyclic tetraoxymethylene, and linear α-, β-, or ϵ-polyoxymethylene; acetaldehyde; and polymeric forms of acetaldehyde including paraldehyde and metaldehyde.

14. A condensation polymer prepared by reacting effective ratios of:

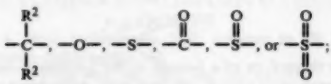
(A) at least one cyclic diol, with at least one reactant selected from the group consisting of (B_1) diethers and (B_2) aldehydes, employing (D) an acidic catalyst under effective reaction conditions;

wherein said (A) cyclic diol is selected from the group consisting of:

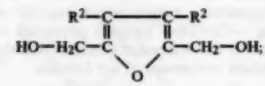


(A1)

wherein each R^1 is independently selected from H and CH_3; Z is a single covalent bond,

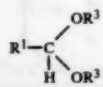


and each R^2 is independently selected from H, CH_3, and C_2H_5; and



(A2)

wherein said (B_1) diether reactant is represented by the formula:



wherein each R^3 is individually selected from alkyl radicals of 1 to 5 carbon atoms, and said aldehyde (B_2) reactant is selected from the group consisting of formaldehyde; polymeric forms of formaldehyde including cyclic trioxymethylene, cyclic tetraoxymethylene, and linear α-, β-, or ϵ-polyoxymethylene; acetaldehyde; and polymeric forms of acetaldehyde including paraldehyde and metaldehyde.

4,477,653

UNSATURATED HOMO- AND/OR COPOLYMERIZABLE POLYESTERS

Günther Hegemann, and Karin Miedeck, both of Hamburg, Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Münster Hiltrup, Fed. Rep. of Germany

Filed Aug. 1, 1983, Ser. No. 519,488

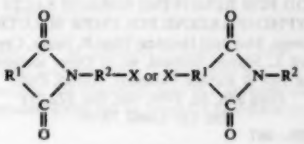
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1982, 3229618

Int. Cl.³ C08G *69/44, 73/16*

U.S. Cl. 528—289 **16 Claims**

1. An improved unsaturated homo- and/or copolymerizable linear polyester prepared from diols and at least one unsaturated dicarboxylic acid or its derivatives capable of forming esters, the improvement comprising that the polyesters contain as component (A), a diol with end-position hydroxyl groups and an average molecular weight of 700 to 1200; as component (B), one or more α,β-unsaturated dicarboxylic acids selected from the group consisting of maleic acid, fumaric acid, itaconic acid, citraconic acid, mesaconic acid, aconitic acid, their derivatives or mixtures thereof; and as component (C), a condensed-in linear diol with 2 to 6 carbon atoms, where the equivalent ratio A:B is aout 0.8:1 to 1.2:1 and the equivalent ratio C:(A + B) is from about 0.5:1 to 1:1.

5. The polyester according to claims **1**, **2**, **3** or **4**, wherein the polyesters are modified by nitrogen-containing compounds of the general formulae:



wherein R^1 is an aliphatic radical in which the two carboxyl radicals capable of forming anhydrides are 1,2- or 1,3- position; R^2 is an alkyl or aryl radical; and X is an OH or CO_2H radical, wherein optionally the linkage of the hydroxyl groups of the nitrogen-containing compounds to the hydroxyl groups of the unsaturated polyester is accomplished by means of di- or triisocyanates.

4,477,654

3-HYDROXYBUTYRATE POLYMERS

Paul A. Holmes, Middlesbrough; Stephen H. Collins, Thirsk, and Leonard F. Wright, Eaglescliffe, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 319,673, Nov. 9, 1981, abandoned. This application Jun. 29, 1982, Ser. No. 393,407

Claims priority, application United Kingdom, Jul. 7, 1981, 8120991; May 12, 1982, 8213697

Int. Cl.³ C08G *63/06*

U.S. Cl. 528—361 **21 Claims**

1. Copolymers having a weight average molecular weight above 10,000 and containing repeat units

—O.CH(CH₃).CH₂.CO— I

and repeat units

—O.CR¹R².(CR³R⁴)ₙ.CO— II

where n is 0 or an integer and R^1, R^2, R^3, and R^4 are each selected from hydrocarbon radicals: halo- and hydroxy-substituted hydrocarbon radicals; hydroxy radicals; halogen atoms; and hydrogen atoms, provided that, where n is 1 and R^2, R^3, and R^4 are each hydrogen atoms, R^1 is not methyl, said

repeat units II constituting 0.1 to 50 mole % of the total repeat units in said copolymer.

4,477,655

MOULDING OF POLY-HYDROXYBUTYRATE CONTAINING BACTERIAL CELL FRAGMENTS

Paul A. Holmes, Great Ayton, England, assignor to Imperial Chemical Industries PLC, Great Britain

Filed Mar. 25, 1983, Ser. No. 479,131

Claims priority, application United Kingdom, Apr. 5, 1982, 82 10004

Int. Cl.³ C08G *63/06*; C08L *67/04*

U.S. Cl. 528—361 **7 Claims**

1. A process for the production of a shaped article comprising forming a composition containing (i) at least 50% by weight of dried cells of a micro-organism containing at least 30% by weight of a β-hydroxybutyrate polymer containing at least 50 mole % of β-hydroxybutyrate residues in the polymer chain, said dried cells having been subjected to a cell wall breakage process, before or after drying, and (ii) sufficient, if any, of an extracted β-hydroxybutyrate polymer containing at least 50 mole % of β-hydroxybutyrate residues in the polymer chain, such that the composition has a melt flow time, as herein defined, of not more than 15 minutes, and thereafter forming said shaped article by melt processing, extrusion or injection moulding, said composition.

4,477,656

METHOD FOR REMOVING SODIUM SALTS FROM POLYPHOSPHAZENE POLYMER SOLUTIONS

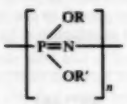
Trent F. Longo, Mayfield Heights; Vispi R. Sagar, Canal Fulton, and Mark L. Stayer, Suffield, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jan. 20, 1984, Ser. No. 572,271

Int. Cl.³ C08G *79/04*

U.S. Cl. 528—487 **8 Claims**

1. A method for removing sodium salts from a mixture of sodium salts and a solution of a polyphosphazene polymer represented by the formula:



wherein R and R′ may be same or different and are selected from the group consisting of alkyl, substituted alkyl, aryl and sustituted aryl groups and n is from 20 to 50,000, said mixture having been formed by reacting in solution a polydichlorophosphazene polymer represented by the formula $—NPCl_2)_n$ wherein n is from 20 to 50,000 with an aldoxide or aryloxide represented by the formula NaOR or NaOR′ wherein R and R′ are defined above; said method comprising the steps of:

(a) treating said mixture with an acid to neutralize any excess alkoxide or aryloxide;

(b) adding water to the mixture to extract sodium salts therefrom resulting in an at least partial separation of the mixture into a polyphosphazene polymer solution phase and a brine phase comprising water and sodium salts.

(c) adding from about 0.1 to about 1.0 parts by weight of a sulfated fatty acid ester of a natural non-petroleum based oil per 100 parts by weight of polyphosphazen polymer solution to the mixture to effect a more complete separation of the polyphosphazene polymer solution phase from the brine phase; and

(d) separating the polyphosphazene polymer solution phase from the brine phase.

4,477,657

PROCESS FOR PREPARING HYDROXYALKYLCELLULOSE ETHERS

Carl P. Strange, Walker; Christopher D. Messelt, Baton Rouge, both of La., and Clark W. Gibson, Bainbridge, Ga., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 8, 1983, Ser. No. 512,086

Int. Cl.³ C08B *11/08*, *11/193*

U.S. Cl. 536—91 **13 Claims**

1. The process for preparinq mixed hydroxyalkylcellulose ethers containing C_3 or higher hydroxyalkoxyl substituents, said process comprising the steps of (a) forming a reaction mass comprising cellulose and an amount of an alkali metal hydroxide at least sufficient to break up the crystallinity of the cellulose and to catalyze a reaction between cellulose and an alkylene oxide and (b) continuously adding a C_3 or higher alkylene oxide and an etherifying agent other than an alkylene oxide to the reaction mass under conditions including an elevated temperature such that the alkylene oxide and the etherifying agent react with the cellulose to attach ether groups thereto.

4,477,658

PROCESS FOR THE PREPARATION OF CEPHAM AND CEPHEM COMPOUNDS

Riccardo Scartazzini, Allschwil, and Hans Bickel, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

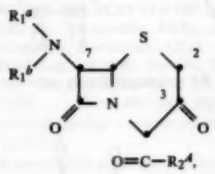
Continuation-in-part of Ser. No. 373,819, Jun. 26, 1973, abandoned. This application Feb. 5, 1976, Ser. No. 655,663

Claims priority, application Switzerland, Jun. 29, 1972, 9787/72; Dec. 22, 1972, 18721/72

Int. Cl.³ C07D *501/04*; A61K *31/545*

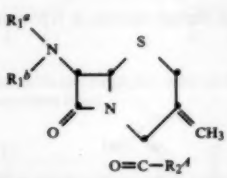
U.S. Cl. 544—16 **21 Claims**

1. Process for the manufacture of a member selected from the group consisting of 7β-aminocepham-3-one-4-carboxylic acid compounds of the formula



(I)

a 1-oxide thereof, or of a 1-oxide of the 3-hydroxy-3-cephem form thereof, or of a alkali, alkaline-earth, ammonium or acid-addition salt of such a compound, wherein $R_1{}^a$ represents a member selected from the group consisting of hydrogen and an amino protective group $R_1{}^A$ and $R_1{}^b$ represents hydrogen, or $R_1{}^a$ and $R_1{}^b$ together represent a bivalent amino protective group, and $R_2{}^A$ represents a radical which together with the carbonyl grouping —C(=O)— forms a protected carboxyl group, characterised in that a member selected from the group consisting of a cepham compound of the formula



(II)

a 1-oxide thereof and a salt of such a compound, is treated with ozone and the resulting ozonide is split by reduction with an ozonide reducing agent selected from the group consisting of catalytically activated hydrogen, a heavy metal or metal alloy

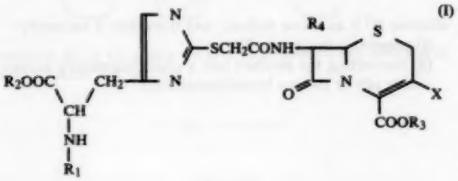
in the presence of a hydrogen donor, an alkali metal iodide in the presence of a hydrogen donor, a suitably substituted ethene compound, a di-lower alkylsulphide, a tri-lower alkylphosphine, a triarylphosphine, a tri-lower alkylphosphite, a hexa-lower alkylphosphine acid triamide, or a base of the pyridine type, and the compound of the formula I, the 1-oxide thereof, the 1-oxide of the 3-hydroxy-3-cephem form thereof, or alkali; alkaline-earth, ammonium or acid-addition salt of such compound is separated by chromatography or crystallization.

4,477,659
CEPHALOSPORIN COMPOUND

Joji Nishikido; Eiji Kodama, both of Fuji, and Mitsuru Shibukawa, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 388,937
Claims priority, application Japan, Jun. 24, 1981, 56-96503
Int. Cl.³ C07D *501/57;* **A61K** *31/545*
U.S. Cl. 544—21 **5 Claims**

1. A cephalosporin compound of the formula (I):



(I)

wherein

X is a hydrogen atom, a chlorine atom, a methyl group, a methoxy group, an acetoxymethyl group or —CH_2SHet wherein Het is a 5-membered heterocyclic ring containing therein 1 to 4 nitrogen, oxygen or sulfur atoms;

R_1, R_2 and R_3 each independently is a hydrogen atom or a protective group which can be pharmaceutically hydrolyzed; and

R_4 is a hydrogen atom or a methoxy group;

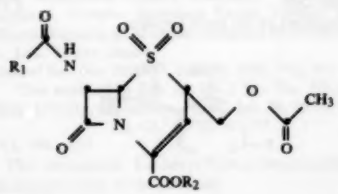
and the pharmaceutically acceptable salts thereof.

4,477,660
7-(S)-ACYLAMINOCEPHALOSPORIN SULFONES AND PROCESS

David A. Hall, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 16, 1982, Ser. No. 442,077
Int. Cl.³ C07D *501/04*
U.S. Cl. 544—28 **40 Claims**

1. A compound of the formula:



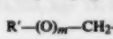
wherein R_1 is

a. C_1 to C_7 alkyl, C_3 to C_7 alkenyl, chloromethyl, dichloromethyl, 4-carboxybutyl, 4-formylbutyl, 4-substituted carboxybutyl, 4-amino-4-carboxybutyl, 4-protected amino-4-carboxybutyl, or 4-protected amino-4-substituted carboxybutyl; or

b. C_1 to C_6 alkoxy, C_3 to C_6 cycloalkoxy, benzyloxy or substituted benzyloxy, wherein the substituents are one to three groups chosen from the group consisting of C_1 to C_4 alkyl, C_1 to C_4 alkoxy, and chloro; or

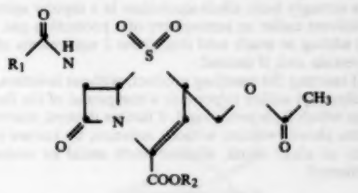
c. 1,4-cyclohexadienyl, phenyl or substituted phenyl, wherein the substituents are one or two groups chosen from the group consisting of chlorine, bromine, hydroxy, protected hydroxy, trifluoromethyl, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, carboxy, carboxymethyl, hydroxymethyl, aminomethyl, and protected aminomethyl; or

d. an arylalkyl group of the formula



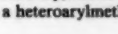
wherein R′ is 1,4-cyclohexadienyl, phenyl or substituted phenyl as defined above, and m is zero or one; or

e. a substituted arylalkyl group of the formula



wherein R″ is R′ as defined above, 2-thienyl, or 3-thienyl; W is hydroxy or protected hydroxy, carboxy or protected carboxy, amino or protected amino; or

f. a heteroarylmethyl group of the formula



wherein R‴ is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-thiazolyl, 5-tetrazolyl or 1-tetrazolyl; and

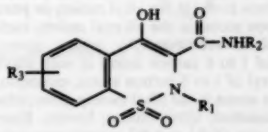
R_2 is hydrogen, the conjugate acid of a nitrogen base that has a pKa between about 9.0 to about 11.5, sodium or potassium ion.

4,477,661
PROCESS FOR THE PREPARATION OF 4-HYDROXY-3-(HETEROCYCLOCARBAMOYL)-2H-1,2-BENZOTHIAZINE-1,1-DIOXIDES

Wolfgang Herrmann, Merzhausen; Wolfram Geibel, Reute, and Gerhard Satzinger, Denzlingen, all of Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 25, 1983, Ser. No. 478,763
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1982, 3212485
Int. Cl.³ C07D *401/12, 417/12*
U.S. Cl. 544—49 **9 Claims**

1. A process for the preparation of a compound of the formula

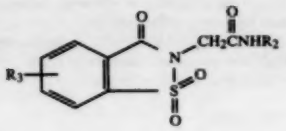


in which

R_1 is a hydrogen atom or a methyl radical, R_2 is thiazole, pyridine, or thiazole or pyridine substituted by methyl or methoxy and R_3 is a hydrogen or halogen atom or a methyl radical, or an alkali metal, alkaline earth metal or amine salt thereof, which comprises carrying out the following steps in one-pot A:

(i) reacting a corresponding thiazole or pyridine amine with a haloacetyl halide in boiling ethyl acetate, and

(ii) reacting the intermediate formed, without isolation, with sodium benzoic acid sulphimide to afford a compound of the formula



wherein

R_3 and R_2 are as defined above; carrying out the following steps in one-pot B:

(i) reacting the product from A with 3 to 4 equivalents of a strongly basic alkali-alcoholate in a dipolar aprotonic solvent under an atmosphere of a protection gas,

(ii) adding so much acid that about 2 equivalents of base remain and, if desired,

(iii) reacting the resulting product, without isolation, with dimethyl sulfate to provide a compound of the formula in which R_1 is methyl and, if further desired, converting the above product, without isolation, by known means to an alkali metal, alkaline earth metal or amine salt thereof.

4,477,662

2-SUBSTITUTED THIO CARBAPENEM DERIVATIVES

David F. Corbett, Reigate; Pamela Brown née Davis, Guildford, and Roger J. Ponsford, Horsham, all of England, assignors to Beecham Group p.l.c., England

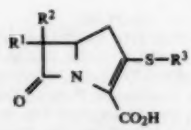
Filed Feb. 3, 1982, Ser. No. 345,484

Claims priority, application United Kingdom, Feb. 4, 1981, 8103350

Int. Cl.³ C07D *487/04*

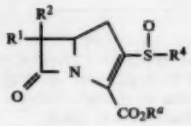
U.S. Cl. 544—212 **16 Claims**

1. A process for the preparation of a compound of the formula (I):



(I)

or a pharmaceutically acceptable salt or in-vivo hydrolysable ester thereof wherein R^1 and R^2 are each independently hydrogen, alkyl of 1 to 10 carbon atoms, alkenyl of up to 10 carbon atoms, alkynyl of up to 10 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkylalkyl of 3 to 6 carbon atoms in the cycloalkyl ring and 1 to 6 carbon atoms in the alkyl moiety, alkylcycloalkyl of 1 to 6 carbon atoms in the alkyl moiety and 3 to 6 carbon atoms in the cycloalkyl ring, phenyl, phenylalkyl of 1 to 6 carbon atoms in the alkyl moiety or phenylalkynyl of up to 6 carbon atoms in the alkynyl moiety each of which is unsubstituted or substituted by amino, mono-, di or trialkylamino of 1 to 6 carbon atoms in each alkyl moiety, hydroxyl, alkoxyl of 1 to 6 carbon atoms, mercapto, alkylthio of 1 to 6 carbon atoms in the alkyl moiety, phenylthio, sulfamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, cyano or carboxy, or one of R^1 and R^2 is hydrogen and the other is sulphonato-oxyethyl and R^3 is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkynyl of 2 to 6 carbon atoms, phenyl, phenylalkyl of 1 to 6 carbon atoms in the alkyl moiety, alkanoyl of 1 to 6 carbon atoms, phenylalkanoyl of 1 to 6 carbon atoms in the alkyl moiety, phenylcarbonyl, heterocyclyl of 4 to 7 ring atoms up to 4 of which are selected from the group consisting of oxygen, sulphur and nitrogen, unsubstituted or substituted by one or more amino, alkanoylamino of 1 to 6 carbon atoms in the alkyl moiety, mono-, di- or trialkylamino of 1 to 6 carbon atoms in each alkyl moiety, hydroxyl, alkoxy of 1 to 6 carbon atoms, mercapto, alkylthio of 1 to 6 carbon atoms in the alkyl moiety, phenylthio, sulphamoyl, carbamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, carboxy, a carboxyl salt or a carboxyl ester, alkanoyloxy of 1 to 6 carbon atoms in the alkyl moiety or phenylcarbonyl; which process comprises reacting a compound of the formula (II):



(II)

wherein R^a is hydrogen, a salt moiety, RHU 1 and R^2 are as above defined, and R^4 is pyrimidinyl, with a compound of the formula (III):

$$R^3—SH \qquad \text{(III)}$$

wherein R^3 is as above defined, and thereafter if necessary:

(i) removing any group R^a,

(ii) converting the product into a pharmaceutically acceptable salt or in-vivo hydrolysable ester.

4,477,663

INTERMEDIATES FOR PREPARING SUBSTITUTED PYRIMIDINONES

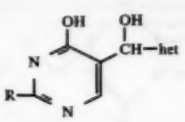
Bing L. Lam, King of Prussia, and Lendon N. Pridgen, Audubon, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Division of Ser. No. 232,105, Feb. 6, 1981, Pat. No. 4,352,933. This application Apr. 7, 1982, Ser. No. 366,443

Int. Cl.³ C07D *401/06*

U.S. Cl. 544—310 **8 Claims**

1. A compound of the basic formula:



in which:

R is —OH, —SH or —SCH_3; and

het is selected from the group consisting of 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-thiazolyl, 2-oxazolyl, 2-imidazolyl, 2-pyrimidyl and 2-pyrazyl, said het optionally monosubstituted by methyl, ethyl, methoxy or ethoxy, or an acid addition salt thereof with hydrochloric, hydriodic, acetic, hydrobromic, sulfuric, phosphoric, oxalic, formic, ethanedisulfonic or methanesulfonic acid.

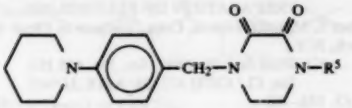
4,477,664

NOVEL 1-(4-PIPERIDINIOBENZYL)-2,3-DIOXOPIPERAZINE DERIVATIVES OR ACID ADDITION SALTS THEREOF

Takako Hori, Toyama; Chosaku Yoshida, Takaoka; Yasuo Kiba, Toyama; Ryuko Takeno, Toyama; Joji Nakano, Toyama; Jun Nitta, Namekawa; Sumiko Kishimoto, Toyama; Shohachi Murakami, Toyama; Hisatsugu Tsuda, Toyama, and Isamu Saikawa, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 169,457, Jul. 16, 1980,. This application Feb. 22, 1982, Ser. No. 351,256
Claims priority, application Japan, Jul. 24, 1979, 54-93234
Int. Cl.³ C07D *401/06, 241/02*
U.S. Cl. 544—360 3 Claims

1. A compound represented by the formula:



wherein R^5 is C_{1-8} alkyl; and a pharmaceutically acceptable acid addition salt thereof.

4,477,665

SUBSTITUTED 2-KETO-1,4-DIAZACYCLOALKANES

John T. Lai, Broadview Heights, and Pyong-Nae Son, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed May 4, 1981, Ser. No. 259,861
Int. Cl.³ C07D *241/04, 401/12*
U.S. Cl. 544—384 2 Claims

1. The compound which is 2,2-dimethyl-2-(3,3,5,5-tetramethyl-2-oxo-1-piperazinyl)ethyl β-(3,5-di-t-butyl-4-hydroxyphenyl propionate).

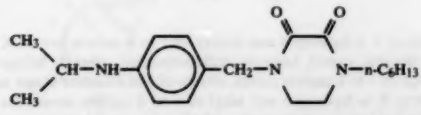
4,477,666

1-(4-AMINOBENZYL)-2,3-DIOXOPIPERAZINE DERIVATIVES, ACID ADDITION SALTS THEREOF AND PROCESS FOR PRODUCING SAME

Takako Hori, Toyama; Chosaku Yoshida, Takaoka; Yasuo Kiba, Toyama; Ryuko Takeno, Toyama; Joji Nakano, Toyama; Jun Nitta, Namekawa; Sumiko Kishimoto, Toyama; Shohachi Murakami, Toyama; Hisatsugu Tsuda, Toyama, and Isamu Saikawa, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 169,457, Jul. 16, 1980, Pat. No. 4,436,921. This application Feb. 12, 1982, Ser. No. 348,272
Claims priority, application Japan, Jul. 24, 1979, 54-93234
Int. Cl.³ C07D *241/04*
U.S. Cl. 544—385 3 Claims

1. The compound 1-n-hexyl-4-[4-(2-propylamino)benzyl]-2,3-dioxopiperazine of the formula



or a pharmaceutically acceptable acid addition salt thereof.

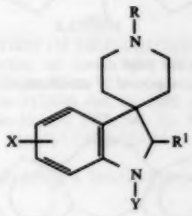
4,477,667

SPIRO[INDOLINE-3,4'-PIPERIDINE]S AND RELATED COMPOUNDS

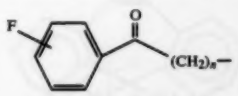
Helen H. Ong, Whippany, N.J., and James A. Profitt, Goshen, Ind., assignors to American Hoechst Corporation, Somerville, N.J.

Division of Ser. No. 121,824, Feb. 15, 1980, Pat. No. 4,307,235, which is a continuation-in-part of Ser. No. 936,185, Aug. 23, 1978, Pat. No. 4,209,625, which is a continuation-in-part of Ser. No. 789,723, Apr. 21, 1977, abandoned. This application Dec. 18, 1981, Ser. No. 332,251
The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.
Int. Cl.³ C07D *471/10*
U.S. Cl. 546—17 1 Claim

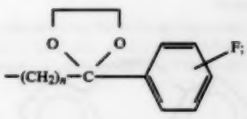
1. A compound of the formula



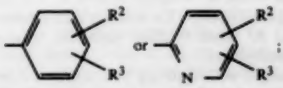
in which R is hydrogen, loweralkyl, cyano, loweralkanoyl, phenoxycarbonyl, phenylloweralkyl, phenyloweralkanoyl, loweralkenyl, cycloalkylloweralkyl in which the cycloalkyl moiety contains 3 to 8 carbon atoms, benzoyl, carbamoyl,



or ethylene glycol ketal of the formula



R^1 is hydrogen or loweralkyl; Y is



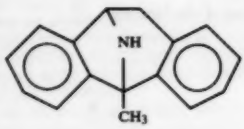
R^2 and R^3 are loweralkoxycarbonylamino or R^2 is loweralkyl amino and R^3 is loweralkoxycarbonylamino; X is hydrogen, halogen, loweralkyl, loweralkoxy or hydroxy; and n is an integer of 1 to 4 and a physiologically acceptable salt thereof.

4,477,668
PROCESS FOR 5-METHYL-10,11-DIHYDRO-5H-DIBENZO[A,D]-CYCLOHEPTEN-5,10-IMINE

Dean R. Bender, Hazlet; Sandor Karady, Mountainside, and Theresa Rothauser, Clark, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

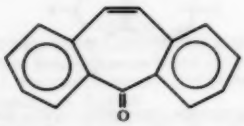
Continuation-in-part of Ser. No. 366,252, Apr. 7, 1982, abandoned. This application Sep. 3, 1982, Ser. No. 414,739
Int. Cl.³ C07D *471/08*
U.S. Cl. 546—72 **9 Claims**

1. A process for the preparation of the racemic compound of structural formula:

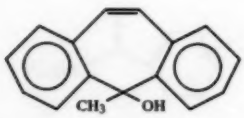


which comprises the steps of:

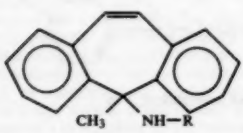
(a) reacting a compound of structural formula:



with a methylmagnesium halide in an ethereal solvent at −50+ to +50° C. to produce the carbinol of structural formula 2 and isolating compound 2:

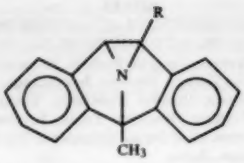


(b) reacting 2 with a substituted amine of formula NH_2-R, and an intermediate strength organic acid in a chlorinated C_{1-3}alkane at −20 to +50° C. to produce the substituted amino compound of structural formula 3 and isolating compound 3:



wherein R is —OR^1 wherein R^1 is hydrogen or C_{1-3}alkyl, or R is —NR^2R^3 wherein R^2 and R^3 are independently hydrogen, C_{1-3}alkyl, C_{2-3}alkanoyl, or benzenoid aroyl, or R^2 and R^3 taken together represent tetramethylene or pentamethylene,

(c) reacting 3 with a strong base selected from the group consisting of an alkali metal hydride, amide or alkoxide, in a benzenoid aromatic solvent, dimethylsulfoxide, dimethylformamide or mixtures thereof at 0° to 190° C., to produce the compound of structural formula 4 and isolating compound 4:



(d) reacting 4 with hydrogen in a solvent in the presence of a noble metal catalyst and isolating compound 5.

4,477,669
PROCESSES AND INTERMEDIATES USEFUL IN THE PREPARATION OF FLUTROLINE

Stephen S. Massett, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 425,151
Int. Cl.³ C07D *471/04;* A61K *31/445*
U.S. Cl. 546—85 **18 Claims**

1. A process for preparing 2-carbobenzoxy-8-fluoro-5-(p-fluorophenyl)-2,3,4,5-tetrahydro-1H-pyrido[4,3-b]indole, which comprises the steps of

(a) chlorinating 1,1-di(p-fluorophenyl)urea with a (C_1–C_4)alkyl hypochlorite in a step (a) reaction-inert solvent to form a first intermediate, 3-chloro-1,1-di(p-fluorophenyl-)urea, in situ;

(b) rearranging the intermediate 3-chlorourea by the action of an alkali metal (C_1–C_3)alkoxide in a step (b) reaction-inert solvent to form a second intermediate, 2-(C_1–C_3)carbalkoxy-1,1-di(p-fluorophenyl)hydrazine, in situ;

(c) hydrolyzing and decarboxylating the intermediate carbalkoxyhydrazine with water in the presence of base in a step (c) reaction-inert solvent to form a third intermediate, 1,1-di(p-fluorophenyl)hydrazine, in situ;

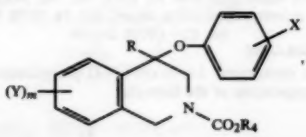
(d) condensing the intermediate 1,1-di(p-fluorophenyl)hydrazine with N-carbobenzoxy-4-piperidone in the presence of a strong acid in a step (d) reaction-inert solvent, and recovering said 2-carbobenzoxy-8-fluoro-5-(p-fluorophenyl)-2,3,4,5-tetrahydro-1H-pyrido[4,3-b]indole.

4,477,670
4-ARYLOXY-1,2,3,4-TETRAHYDROISOQUINOLINES

Richard C. Effland, Bridgewater; Larry Davis, Sergeantsville, and Joseph T. Klein, Bridgewater, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 235,801, Feb. 19, 1981, Pat. No. 4,375,471. This application Dec. 20, 1982, Ser. No. 451,139
Int. Cl.³ C07D *217/24;* A61K *31/47*
U.S. Cl. 546—141 **6 Claims**

1. A 4-aryloxy-1,2,3,4-tetrahydroisoquinoline having the formula



where Y is hydrogen and alkoxy of 1 to 6 carbon atoms; X is hydrogen, cyano, benzoyl, trifluoromethyl, phenyl, halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms and nitro; R is hydrogen and alkyl of 1 to 6 carbon atoms; R_4 is alkyl of 1 to 6 carbon atoms and phenyl; and m is an integer of 1 or 2.

4,477,671

3-ACETOXY OR BENZYLOXY-2-ACETOXYMETHYL-6-[1-ACETOXY-2-(N-TERT-BUTYLACETAMIDO)ETHYL]PYRIDINE INTERMEDIATES

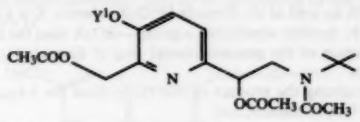
Berkeley W. Cue, Gales Ferry, and Stephen S. Massett, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 340,172, Jan. 18, 1982, , which is a division of Ser. No. 232,923, Feb. 9, 1981, abandoned. This application Jun. 2, 1983, Ser. No. 500,210

Int. Cl.³ C07D *213/75*

U.S. Cl. 546—291 3 Claims

1. A compound of formula



wherein Y^1 is benzyl or $COCH_3$.

4,477,672

ALKYLSULFONYLOXY SUBSTITUTED PHENOXY ALKANOIC ESTERS

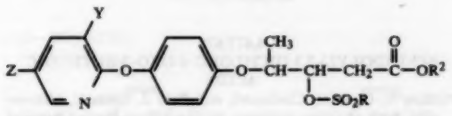
Gustave K. Kohn, Palo Alto, and Joe T. Bamberg, Redwood City, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Aug. 6, 1982, Ser. No. 405,853

Int. Cl.³ C07D *213/61, 213/62, 213/64*

U.S. Cl. 546—294 5 Claims

1. A compound of the following formula:



wherein,

R is a primary lower alkyl;

R^2 is lower alkyl; and

each of Y and Z is independently selected from hydrogen, lower alkyl, lower haloalkyl, lower alkoxy, lower haloalkoxy, bromo, chloro, fluoro, nitro and cyano.

4,477,673

PROCESS FOR THE PREPARATION OF SUBSTITUTED DIVINYLPYRIDINES AND NOVEL SUBSTITUTED DIVINYLPYRIDINES

Jürgen Kaschig, Ardsley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

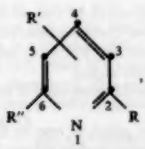
Filed Jan. 17, 1983, Ser. No. 458,232

Claims priority, application Switzerland, Jan. 27, 1982, 501/82

Int. Cl.³ C07D *213/30, 213/16, 213/26, 213/57*

U.S. Cl. 546—344 20 Claims

17. A compound of the formula I



(I)

wherein

R′ is bound in the 4- or 5-position,

R and R′ are $—CH_2OH$, $—CH_2CH_2OH$, $—CH_2CH_2OCH_2C_6H_5$, $—CH_2X$, $—CH_2P^{\oplus}(Y)_3X^{\ominus}$, $—CH_2P(O)(C_{1-3}alkoxy)_2$ or $—CH{=}CH_2$,

R″ is C_{1-10}alkyl,

X is a halogen atom,

$X^{\ominus}$ is the anion corresponding to X and

Y is phenyl which may be substituted by a C_1–C_5alkyl group,

with the exception of 2,4-bis(β-hydroxymethyl)-6-methylpyridine and 2,4-divinyl-6-methylpyridine.

20. 2,4-Bis(hydroxymethyl)-6-methylpyridine according to claim 17.

4,477,674

PREPARATION OF DIHYDROTHIAZOLES

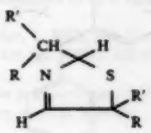
Bernardus A. O. Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 112,506, Jan. 16, 1980, abandoned. This application Mar. 4, 1983, Ser. No. 472,332

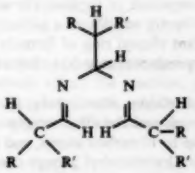
Int. Cl.³ C07D *233/04*

U.S. Cl. 548—146 2 Claims

1. A process of preparing a dihydrothiazole of the formula



which comprises reacting a corresponding reactant of the formula



where R and R′ are selected from the group consisting of alkyl, cycloalkyl, aryl, aralkyl and alkarylalkyl, with sulfur in stoichiometric amounts at temperatures of from 40°–160° C. for 1–24 hours.

4,477,675

PROCESS FOR FORMING CERTAIN SUBSTITUTED PHTHALIMIDINES

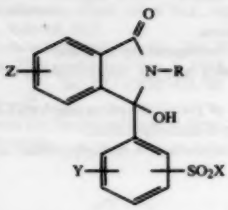
Joseph Auerbach, Brooklyn, and Frederick A. Golec, Jr., Ossining, both of N.Y., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 202,806, Oct. 13, 1980, abandoned. This application Sep. 7, 1982, Ser. No. 415,289

Int. Cl.³ C07D *209/48, 209/00*; A61K *31/40*

U.S. Cl. 548—480 8 Claims

1. The process of making a compound of the formula (I)

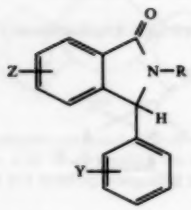


(1)

wherein Y and Z are independently hydrogen, halogen, alkyl, alkoxy, trifluoromethyl, hydroxy, alkanoyloxy, or alkanoylamino;

X is F, Cl, or Br; and

R is hydrogen, alkyl, cycloalkyl, or aryl-alkyl; from a compound of the formula (2)



(2)

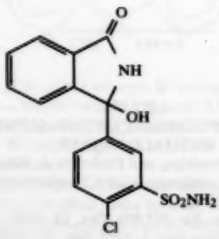
wherein Y, Z and R have the meanings given above, comprising:

(a) reacting a compound of formula (2) with a sulfonating agent which directly substitutes a sulfonic group $—SO_2X$ onto the pendant phenyl ring of formula (2); and then

(b) oxidizing the product of step (a) to form the compound of formula (1);

wherein the alkyl, alkoxy, alkanoyloxy, alkanoylamino, and cycloalkyl groups and the alkyl moiety of aryl-alkyl can each contain up to 10 carbon atoms, and the aryl moieties of aryl-alkyl are hydrocarbyl groups containing up to 10 carbon atoms.

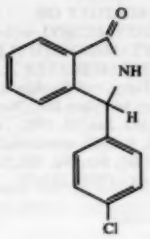
7. The process of making a compound of the formula (3)



(3)

comprising

(a) reacting a compound of the formula (4)



(4)

with an acid of the formula HSO_3X wherein X is Cl, Br, or F, thereby substituting a group $—SO_2X$ onto the meta-position of the pendant phenyl ring of formula (4); and then

(b) oxidizing the product of step (a) to form the 3-hydroxy derivative thereof; and

(c) reacting the product of either step (a) or step (b) with a basic nitrogen compound to convert the $—SO_2X$ group to a $—SO_2NH_2$ group.

4,477,676

4-(3-INDOLYL)-2,3-DICHLORO-4-OXO-2-BUTENOIC ACIDS

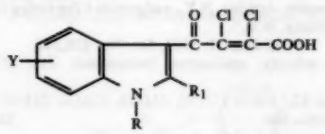
Nathan N. Crounse, Cincinnati, and Paul J. Schmidt, Sharonville, both of Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Division of Ser. No. 166,209, Jul. 7, 1980, Pat. No. 4,377,689, which is a division of Ser. No. 058,960, Jul. 19, 1979, Pat. No. 4,275,121, which is a continuation-in-part of Ser. No. 829,002, Aug. 30, 1977, abandoned, which is a division of Ser. No. 651,607, Jan. 22, 1976, Pat. No. 4,075,224. This application Jul. 6, 1982, Ser. No. 395,276

Int. Cl.[3] **C07D** *209/18, 209/24*

U.S. Cl. 548—493 **5 Claims**

1. A 4-(1-R-2-R_1-5/6-Y-3-indolyl)-2,3-dichloro-4-oxo-2-butenoic acid having the formula



wherein:

R represents hydrogen, non-tertiary alkyl of one to eight carbon atoms, alkenyl of two to four carbon atoms, benzyl or benzyl substituted in the benzene ring by one or two of halo or alkyl of one to three carbon atoms;

R_1 represents hydrogen, alkyl of one to three carbon atoms or phenyl; and

Y represents one or two hydrogen, alkyl of one to three carbon atoms, alkoxy of one to three carbon atoms, halo or nitro.

4,477,677

PROCESS FOR THE PREPARATION OF 1-(4-CHLOROBENZOYL)-5-METHOXY-2-METHYL-3-INDOLEACETOXYACETIC ACID

Karl-Heinz Boltze, Borod, and Hans D. Lehnen, Troisdorf, both of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co. KG, Cologne, Fed. Rep. of Germany

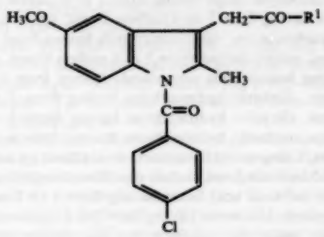
Filed Feb. 25, 1983, Ser. No. 469,676

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206886

Int. Cl.³ C07D *209/28*

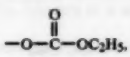
U.S. Cl. 548—501 5 Claims

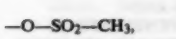
1. Process for the preparation of 1-(4-chlorobenzoyl)-5 -methoxy-2-methyl-3-indoleacetoxyacetic acid (I), characterised in that indolecarboxylic acid or its derivatives of the general formula II

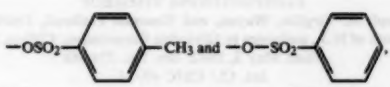


(II)

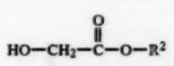
in which R^1 represents the radical







is reacted with compounds of the general formula III



(III)

in which R^2 represents hydrogen or ammonium, in the presence of inert organic solvents in a temperature range from −10° C. to 80° C.

4,477,678

SULFUR-CONTAINING FLAVORING AGENTS

Steven van den Bosch, Wondenberg; Dirk K. Kettenes, Putten; Kris B. de Ross, Hoevelaken; Gerben Sipma, Hoevelaken, and Jan Stoffelsma, Hoevelaken, all of Netherlands, assignors to P.F.W. Beheer B.V., Netherlands

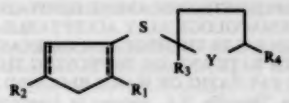
Division of Ser. No. 908,492, May 22, 1978, Pat. No. 4,380,655, which is a division of Ser. No. 762,534, Jan. 26, 1977, Pat. No. 4,119,737, which is a continuation of Ser. No. 531,274, Dec. 10, 1974, abandoned. This application Jan. 4, 1983, Ser. No. 455,619

Claims priority, application United Kingdom, Dec. 13, 1973, 57908/73

Int. Cl.³ C07D *333/00, 311/72;* A23L *2/26*

U.S. Cl. 549—62 8 Claims

1. A chemical compound having the structural formula:



wherein

the five carbon ring is a cyclopentane ring or a $\Delta^{2,3}$-cyclopentene ring;

Y is oxygen or sulfur; and R_1, R_2, R_3 and R_4 are hydrogen or 1 to 3 carbon alkyl groups.

4,477,679

PRODUCTION OF ALKYL-5-SUBSTITUTED-3-FUROATE COMPOUNDS

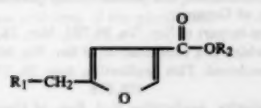
David V. Petrocine, Saddle River, and John A. Swidinsky, Jackson, both of N.J., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Mar. 1, 1983, Ser. No. 471,082

Int. Cl.³ C07D *308/68*

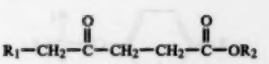
U.S. Cl. 549—486 3 Claims

1. A process for the production of alkyl-5-substituted-3-furoate compounds of the general formula

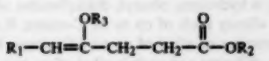


where R_1 is an unsubstituted or substituted aryl which substituent will not adversely affect the reaction, and R_2 is a lower alkyl having 1 to 6 carbon atoms, which method comprises

(a) reacting a compound of the formula

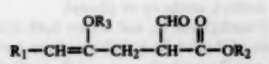


with an alkyl orthoformate under conditions which favor production of an enol ether of the formula



where R_3 represents the alkyl group of the alkyl orthoformate,

(b) reacting the product of step (a) with sodium methoxide and an excess of carbon monoxide, to produce an alkyl-2-formyl-4-alkoxy-5-substituted pent-4-enoate represented as



(c) reacting the product of step (b) with acid.

4,477,680
3-AMINO-4-HYDROXY(OR ALKOXY)PHENETHANOLAMINE DERIVATIVES AND PHARMACOLOGICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF FOR INCREASING THE GROWTH RATE AND/OR IMPROVING THE LEAN MEAT TO FAT RATIO OF WARM-BLOODED ANIMALS

Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

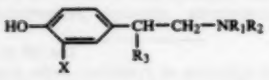
Continuation-in-part of Ser. No. 326,878, Dec. 2, 1981, Pat. No. 4,404,224. This application Nov. 5, 1982, Ser. No. 439,495

Claims priority, application United Kingdom, Oct. 6, 1982, 8228528

Int. Cl.³ C07C *143/74*; A61K *31/18*

U.S. Cl. 564—82 3 Claims

1. A compound having the structural formula:



wherein X is $N(SO_2R_8)_2$, and R_8 is C_1–C_4 alkyl; R_1 is hydrogen or C_1–C_4 alkyl; R_2 is hydrogen, C_1–C_4 alkyl, benzyl, phenethyl, α-methylphenethyl, or α,α-dimethylphenethyl; R_3 is OH; with the provisos that when R_2 is benzyl, phenethyl, α-methylphenethyl or α,α-dimethylphenethyl, R_1 of NR_1R_2 is hydrogen; and the optically active isomers, and the pharmacologically acceptable acid addition and metal salts thereof.

4,477,681
PHOTOSENSITIVE HYDROXYALKYLPHENONES

Jüergen Gehlhaus, Heppenheim, and Manfred Kieser, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

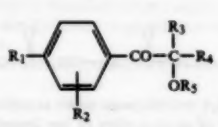
Continuation-in-part of Ser. No. 99,792, Nov. 26, 1979, Pat. No. 4,347,111, which is a continuation of Ser. No. 906,505, May 16, 1978, abandoned. This application Aug. 16, 1982, Ser. No. 408,576

Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722264

Int. Cl.³ C07C *49/213*

U.S. Cl. 568—336 10 Claims

1. A compound of the formula



wherein R_1 is hydrogen, phenyl, dialkylamino of 2–4 C-atoms or alkyl or alkoxy each of up to 18 C-atoms; R_2 is hydrogen, chlorine, bromine or alkyl of up to 4 C-atoms; R_3 and R_4 are the same or different and each is alkyl of up to 6 C-atoms; and R_5 is hydrogen, or alkyl or alkanoyl each of up to 4 C-atoms; with the proviso that

(a) if R_1 and R_2 are both hydrogen and R_3 and R_4 are both methyl:
R_5 is not hydrogen, methyl or acetyl;

(b) if R_2 and R_5 are both hydrogen and R_3 and R_4 are both methyl:
R_1 is not methyl, methoxy or phenyl;

(c) If R_2 is 2-methyl and R_1 and R_5 are both hydrogen:
at least one of R_3 and R_4 is different from methyl;

(d) if R_1,R_2 and R_5 are hydrogen and R_4 is ethyl:
R_3 is neither methyl nor ethyl.

4,477,682
PROCESS FOR PRODUCING 4-HYDROXY-2,4,6-TRIMETHYLCYCLOHEXA-2,5-DIENE-1-ONE

Tetsuo Tomita, Sakura; Masahiro Jono, and Toshiaki Takata, both of Kanamachi, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 21, 1982, Ser. No. 451,788

Claims priority, application Japan, Dec. 28, 1981, 56-211901

Int. Cl.³ C07C *45/30*

U.S. Cl. 568—362 35 Claims

1. A process for producing 4-hydroxy-2,4,6-trimethylcyclohexa-2,5-diene-1-one which comprises 2,4,6-trimethylphenol with reacting hypohalogenous acid or salt thereof in an aqueous medium or mixed medium of water and at least one organic solvent selected from the group consisting of nitriles having from 1 to 4 carbon atoms, carboxylic acid esters derived from carboxylic acids having from 1 to 6 carbon atoms and alcohols having from 1 to 6 carbon atoms, ethers having from 2 to 8 carbon atoms, nitro compounds having from 1 to 6 carbon atoms, amides having from 1 to 4 carbon atoms, nitrogen-containing heterocyclic compounds having from 4 to 7 carbon atoms, aliphatic hydrocarbons having from 5 to 10 carbon atoms, alicyclic hydrocarbons having from 5 to 10 carbon atoms, aromatic hydrocarbons having from 6 to 12 carbon atoms, halogenated hydrocarbons obtained by halogenation of said hydrocarbons, carbon disulfide, dimethylsulfoxide, aliphatic carbonic acid esters having from 3 to 7 carbon atoms, phosphoric acid esters having from 3 to 9 carbon atoms, and sulforane under the condition that the weight ratio of water to 2,4,6-trimethylphenol is at least 10:1.

4,477,683
3-METHYL-1-(2,2,4-AND 2,4,4-TRIMETHYL-1-CYCLOPENTYLIDENE) PENT-2-EN-4-ONE AND ISOMERS, AND PERFUME COMPOSITIONS THEREOF

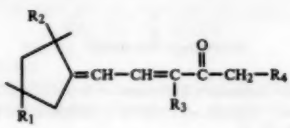
Joseph A. Virgilio, Wayne, and Emanuel Heilweil, Fairfield, both of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed May 3, 1982, Ser. No. 374,368

Int. Cl.³ C07C *49/21*

U.S. Cl. 568—379 5 Claims

1. A compound of the formula



wherein:

R_1, R_2, R_3 and R_4 represent hydrogen or methyl provided that
R_1 is not the same as R_2 and
R_3 is not the same as R_4.

4,477,684
11-DEOXY-11α-ALKYL-PGE COMPOUNDS FROM PGA COMPOUNDS BY LITHIUM ALKYLATION

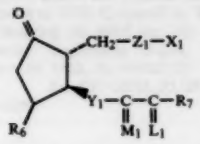
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 23, 1982, Ser. No. 391,098

Int. Cl.³ C07C *177/00*

U.S. Cl. 568—379 2 Claims

1. An 11-deoxy-11α-alkylprostaglandin E compound of formula II



II

wherein Z_1 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—$C(R_2)_2$—,
(2) cis—CH_2CH=CH—$(CH_2)_g$—CH_2—,
(3) trans—$(CH_2)_2$—$(CH_2)_g$—CH=CH—,
(4) —$(CH_2)_3$—$(CH_2)_g$—$C(R_2)_2$—,
(5) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(6) —$(CH_2)_2$—O—$(CH_2)_g$—CH_2—,
(7) —$(CH_2)_3$—O—$(CH_2)_g$—, or
(8) —(m—Ph)—Z_3—$(CH_2)_g$—,
wherein R_2 is hydrogen or fluoro, g is one, two, or three, Z_3 is oxa or methylene, and (m—Ph) is inter-meta-phenylene;
wherein X_1 is —COR_{52}, wherein R_{52} is (C_1–C_4)alkyl;
wherein Y_1 is trans—CH=CH—, cis—CH=CH—, —CH_2CH_2—, or —C≡C—;
wherein L_1 is α—R_3:β—R_4, α—R_4:β—R_3, or a mixture of α—R_3:β—R_4 and a—R_4:β—R_3 wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro and M_1 is α—OH:β—R_5 or α—R_5:b—OH, wherein R_5 is hydrogen or methyl or wherein L_1 is α—OH:β—R_5 or α—R_5:β—OH and M_1 is α—H:β—H;
wherein R_7 is
(1) —C_mH_{2m}—CH_3, wherein m is an integer from one to 5, inclusive,
(2) phenoxy optionally substituted by one, two or three chloro, fluoro, trifluoromethyl, (C_1–C_3)alkyl, or (C_1–C_3)alkoxy, with the proviso that not more than two substituents are other than alkyl, with the proviso that R_7 is phenoxy or substituted phenoxy, only when R_3 and R_4 are hydrogen or methyl, being the same or different,
(3) phenyl, benzyl, phenylethyl, or phenylpropyl optionally substituted on the aromatic ring by one, two, or three chloro, fluoro, trifluoromethyl, (C_1–C_3)alkyl, or (C_1–C_3)alkoxy, with the proviso that not more than two substituents are other than alkyl,
(4) cis—CH=CH—CH_2—CH_3,
(5) —$(CH_2)_2$—CH(OH)—CH_3, or
(6) —$(CH_2)_3$—CH=$C(CH_3)_2$;
wherein —$C(L_1)$—R_7 taken together is
(1) (C_4-C_7)cycloalkyl optionally substituted by one to 3 (C_1–C_5)alkyl;
(2) 2-(2-furyl)ethyl,
(3) 2-(3-thienyl)ethoxy, or
(4) 3-thienyloxymethyl; and
wherein R_6 is (C_1–C_4)alkyl.

4,477,685

HYDROFORMYLATION PROCESS TO PREPARE GLYCOLALDEHYDES

Albert S. Chan, St. Charles, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 20, 1982, Ser. No. 409,819
Int. Cl.³ C07C 45/49
U.S. Cl. 568—462 **17 Claims**

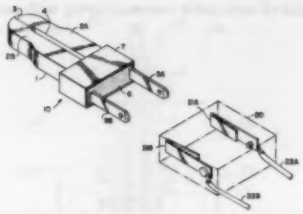
4. A process for the production of glycol aldehyde which comprises reacting carbon monoxide, hydrogen and formaldehyde in a solvent system at elevated temperature of about 70° to about 150° C. and elevated pressure in the presence of a rhodium catalyst effective to produce glycol aldehyde from such reactants, and having present a triaryl phosphine less basic than triphenylphosphine and in which there is a strongly electron-withdrawing group having a σ_p° value of at least 0.4 substituted on an aryl ring of the phosphine.

4,477,686

THERMOELECTRIC ELEMENT

Takashi Nakajima, Chiba, and Makoto Suzuki, Tokyo, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,669
Claims priority, application Japan, Dec. 2, 1981, 56-178787[U]; Dec. 28, 1981, 56-193302[U]
Int. Cl.³ H01L *35/28*
U.S. Cl. 136—203 9 Claims



1. A thermoelectric element for providing electrical energy through heat transfer comprising:

a thermoelectric elemental body having a P-type semiconductor leg and an N-type semiconductor leg coupled directly together at one extreme end of said body;

an insulation binder for fixing said P-type semiconductor leg and said N-type semiconductor leg at another extreme end of said body,

a mechanical support member of heat transfer material surrounding said insulation binder, for supporting said elemental body and radiating heat from the element, and

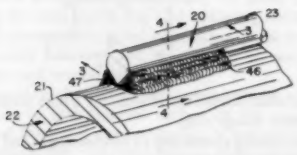
at least one terminal coupled with at least one of said semiconductor legs, for electrically coupling the element to an external circuit and radiating heat from the element.

4,477,687

THERMOCOUPLE AND METHOD OF MAKING THE THERMOCOUPLE AND OF MOUNTING THE THERMOCOUPLE ON A HEAT EXCHANGER TUBE

Philip F. Finney, 425 E. Washington, Villa Park, Ill. 60181

Filed Jun. 6, 1983, Ser. No. 501,282
Int. Cl.³ H01L *35/02*
U.S. Cl. 136—229 34 Claims



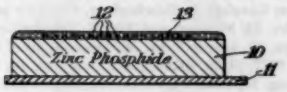
1. A thermocouple assembly for measuring the surface temperature of a fired heat exchanger tube comprising, a cold junction end having a temperature readout instrument and a hot junction end having a temperature sensing junction member, the ends being connected by sheathed thermocouple conductors, said sheathed thermocouple conductors including an elongated tubular metal sheath, a pair of spaced thermocouple conductors within said sheath, electrical insulating material spacing and supporting said conductors within the sheath in insulating relation from each other and from the sheath, said hot junction end being defined by a thermojunction tip, said tip including a face which the conductor ends, insulation and sheath are substantially coplanar, a junction member against the face and connected to said conductors and extending from the face of said sheath and spaced from the sheath to thermally isolate the junction member from the sheath when applied to the measured surface.

4,477,688

PHOTOVOLTAIC CELLS EMPLOYING ZINC PHOSPHIDE

Allen M. Barnett, Newark; Anthony W. Catalano, Wilmington; Vikram L. Dalal, Newark, all of Del.; James V. Masi, Wilbraham, Mass.; John D. Meakin, Newark, Del., and Robert B. Hall, Newark, Del., assignors to The University of Delaware, Newark, Del.

Filed Sep. 22, 1978, Ser. No. 944,971
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—258 4 Claims



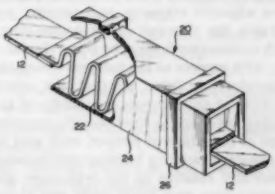
1. In a photovoltaic cell of the type comprising, as successive components in the electrical path through the device, a first electrical contact means, a first semiconductor functioning as an absorber in ohmic electrical contact with said first contact means, collector in rectifying electrical contact with said absorber and forming a junction therewith, and means for electrically contacting said collector, the improvement wherein said absorber comprises zinc phosphide, said absorber comprising a thin film of polycrystalline zinc phosphide, said first contact means comprising a layer of highly conductive metal, a thin film diffusion barrier being disposed between said metal and said absorber to prevent said conductive metal from diffusing into said thin film, and said diffusion barrier being carbon.

4,477,689

CURRENT RELAYING DEVICE USED WITH SUPERCONDUCTOR APPARATUS

Hiroshi Ogasahara; Osatsugu Asai, both of Kobe, and Takashi Sato, Kawanishi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 2, 1982, Ser. No. 394,813
Claims priority, application Japan, Jul. 2, 1981, 56-100095[U]
Int. Cl.³ H01R *4/68;* H01L *39/02*
U.S. Cl. 174—15 CA 2 Claims



1. A current relaying device for use with a superconductor apparatus comprising a current conducting member in the form of a strip bent into a corrugated shape, a pair of connecting electric conductors in the form of strips connected to both ends of said current conducting member, an electrically insulating casing surrounding an outer periphery of said current conducting member, and a pair of electrically insulating frame members complementary in cross section to and each fixed to an end portion of said casing for externally supporting said casing, said current conducting member being supported solely by engaging an inside surface of said casing and being slideable lengthwise of said casing to absorb expansion and contraction

of said superconductor apparatus transmitted to said current conducting member through one of said strips.

4,477,690

COUPLING UNIT OF TWO MULTILAYER CABLES OF HIGH-VOLTAGE GENERATOR STATOR WINDING

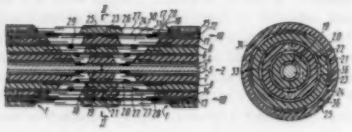
Pavel Z. Nikitin, ulitsa Stroitelei, 5, korpus 1, kv. 2, Moscow; Yanush B. Danilevich, ulitsa Tipanova, 29, kv. 681, Leningrad; Konstantin N. Maslennikov, ulitsa Petukhova, 138, kv. 87, Novosibirsk; Pavel S. Kabanov, ulitsa Sevanskaya, 19, korpus 1, kv. 22, Moscow; Konstantin F. Potekhin, ulitsa Stanislavskogo, 11, kv. 186, Novosibirsk; Lev A. Zolotov, bulvar Yana Rainisa, 9, kv. 55, Moscow; Alexandr I. Nikolsky, ulitsa Dubninskaya, 14, korpus 2, kv. 59, Moscow; Tibor M. Nemeni, ulitsa Khalturinskaya, 11, kv. 245, Moscow; Veniamin S. Turutin, ulitsa Perovskaya, 8, korpus 1, kv. 26, Moscow; Gennady A. Bezchastnov, Polessky proezd, 4, korpus 2, kv. 33, Moscow, and Jury F. Telezhnikov, ulitsa Chusovskaya, 11, korpus 8, kv. 28, Moscow, all of U.S.S.R.

PCT No. PCT/SU80/00204, § 371 Date Aug. 10, 1982, § 102(e) Date Aug. 10, 1982, PCT Pub. No. WO82/02123, PCT Pub. Date Jun. 24, 1982

PCT Filed Dec. 18, 1980, Ser. No. 414,326

Int. Cl.³ H02K *3/24, 3/40*; H01R *9/05*

U.S. Cl. 174—15 C **1 Claim**



1. A coupling unit of two multilayer, high-voltage cables, said coupling unit comprising:

cable ends of two multilayer cables which have concentrically arranged conducting layers made as tubes separated by insulating layers,

jumpers electrically connecting corresponding conducting layers of the multilayer cables, each insulating layer adjacent to the jumpers having an outer, axial face in the shape of a frustum, each said jumper defined by a plurality of individual elements forming a part of a hollow cylinder limited axially by two planes, each said jumper connecting respective conducting layers of the cable ends and arranged with respect to one another so that each jumper is a cylindrical surface having circumferentially spaced slots between adjacent elements and running parallel to the jumper axis, the elements of respective jumpers connecting each conducting layer tube being displaced circumferentially with respect to the jumpers connecting the innermost conducting layer so that the circumferentially spaced slots of the jumpers outwardly of said innermost conducting layer are located radially opposite the jumper elements of the adjacent jumper, each said jumper carrying an annular insulating bushing said bushings positioned symmetrically relative to the transverse plane dividing said jumper into two equal parts and extending axially relative to the cables,

thin-walled insulating cylinders secured in said bushings and arranged concentrically with the jumpers, and similar thin-walled cylinders secured in and extending from each insulating layer of the cable ends,

the opposite ends of the insulating bushings and the outer ends of the insulating layers, as well as the surfaces of two adjacent jumpers, the inner conducting layer, the conducting layer tubes, and the conducting layer coupled thereto, between which said insulating bushings are situated, form insulation chambers containing the thin-walled insulating cylinders, adjacent insulating cylinders having ends in overlapped relationship, whereas the surface of the outermost jumper and the tube of the external conducting layer coupled thereto at the surface of the cable end and the ends of the insulation bushings, as well as the surfaces of the thin-walled insulating cylinders, form an insulation cavity, the number of insulating cavities of each cable end being less by one than the number of insulating layers, and the insulation cavities of each cable end communicating with one another and

cooling ducts in each cable formed by two adjacent, spaced concentric tubes electrically connected to one another and forming one conducting layer, corresponding cooling ducts of each cable communicating with each other.

4,477,691

HIGH TENSION METAL-CLAD INSTALLATION SUBDIVIDED INTO TIGHT COMPARTMENTS

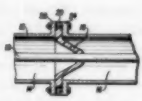
André Giboulet, Saint-Egreve; Georges Henry, St. Martin-Le-Vinoux, and Jean Kieffer, St. Martin D'Heres, all of France, assignors to Merlin Gerin, Grenoble, France

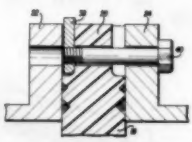
Filed Feb. 16, 1983, Ser. No. 466,909

Claims priority, application France, Feb. 19, 1982, 82 02910

Int. Cl.³ H02G *5/06*

U.S. Cl. 174—22 C **6 Claims**





1. A metal-clad electric installation for a high tension metal-clad substation, comprising:

a metallic housing containing an insulating gas and having at least one section connected to an adjacent section by a pair of connected flanges,

a supporting insulator having an external border interposed between said connected flanges thereby partitioning said housing into tight compartments,

aligned openings in said flanges and in said border, and connecting means passing through said openings for connecting said sections,

an electrical conductor placed inside the metallic housing and supported by said insulator,

at least a pair of slots provided in the interface of said external border and one of said flanges so that each slot surrounds one of said aligned openings,

nuts shaped as a small plate for insertion into said slots,

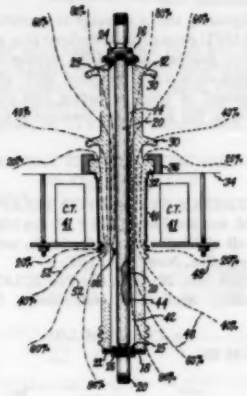
and screws for screwing into said nuts to fix the external border to the other of said flanges.

4,477,692

HIGH VOLTAGE TERMINAL BUSHING FOR ELECTRICAL APPARATUS

Robert H. Brealey, Exton, Pa., assignor to General Electric Company, King of Prussia, Pa.

Filed Jul. 21, 1981, Ser. No. 285,646
Int. Cl.³ H01B 17/26
U.S. Cl. 174—31 R 5 Claims



1. In a high-voltage terminal bushing,

a tubular shell of electrical insulating material having a pair of opposed ends and a central passageway extending between said ends,

an electrical conductor extending between said ends via said central passageway,

means including a pair of metal end caps at the opposite ends of said insulating shell and at opposite ends of said conductor for mounting said conductor within said central passageway,

said conductor having an external surface that is spaced from the internal surface of said passageway,

grounded structure disposed externally of said shell at a location intermediate the ends of the shell, said bushing being so constructed that said insulating shell is disposed in all potential electrical breakdown paths between said grounded structure and the portion of said conductor within said central passageway,

a thin coating of electrical insulating material covering and bonded to said external surface of the conductor and spaced from said internal surface of the passageway by a cylindrical gap containing gaseous dielectric that is dielectrically stressed in the region of said grounded structure when the bushing is energized,

said coating being located in a position between said end caps and having a thickness of at least about 10 mils covering at least the entire portion of the external surface of said conductor that is located in the region of said grounded structure,

said coating having a sufficient dielectric strength to prevent any corona streamers from said conductor from impinging against said internal surface of said passageway at impulse voltages up to the rated impulse insulation level required by industry standards,

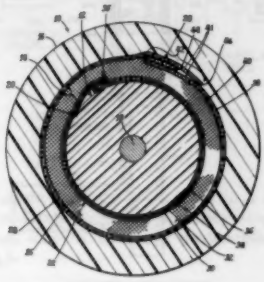
the bushing being of such design that without said coating, impulse voltages beneath said rated impulse insulation level produce corona streamers from said conductor that impinge against said internal surface of said passageway.

4,477,693

MULTIPLY SHIELDED COAXIAL CABLE WITH VERY LOW TRANSFER IMPEDANCE

James A. Krabec, Chicago; John W. Kincaid, Batavia, both of Ill., and Paul B. Miller, Richmond, Ind., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Dec. 9, 1982, Ser. No. 448,219
Int. Cl.³ H01B 11/06
U.S. Cl. 174—36 15 Claims



1. A multiply shielded coaxial cable comprising:

a core having a central conductor and dielectric material surrounding said conductor;

shielding surrounding said core, said shielding comprising an inner foil laminate, a braided sleeve, and an outer foil laminate in radially outward succession, respectively, said braided sleeve being of conductive material, each of said foil laminates including at least one conductive layer and one non-conductive layer, each of said foil laminates being wrapped so as to define a respective region of overlap, at least one of said foil laminates being folded back upon itself so that at least one conductive layer electrically and physically contacts itself in the respective region of overlap, said outer foil laminate being outward of all braided material of said shielding; and

a protective jacket surrounding said shielding.

4,477,694

THROUGH-FLOOR ELECTRICAL OUTLET FITTING

John E. Kohaut, 10 Hepworth Pl., West Orange, N.J. 07052, assignor to John E. Kohaut, West Orange and Raceway Components, Inc., Nutley, both of, N.J.

Filed Feb. 8, 1982, Ser. No. 346,415
Int. Cl.³ H02G 3/22
U.S. Cl. 174—48 8 Claims

1. In an electrical insert device for insertion into an opening formed in a structure and enabling passage therethrough of electrical function cables, said insert device including an upper end, and comprising:

an elongated raceway formed in said insert device for said passage of cables therethrough,

said cable raceway having an end opening toward said upper end of the insert device,

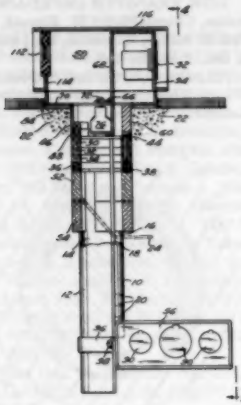
a flexible tubular intumescent ring section proportioned to be snugly positioned on said raceway and intumescing upon exposure to heat, thereupon expanding in different directions and sealing the raceway and cables therein against heat and smoke, and being resistant to moisture attack and degradation,

bracket means, to which the service head member is connectable,

locking means positioned on said bracket means, and

means movably positioned in said bracket means and engagable with said locking means for movement of the latter into locking engagement with the structural opening to lock the insert device therein,

said locking means being of generally Z-shaped cross-section,



said means so movably positioned in said bracket means so engaging the locking means generally intermediate its length for said movement thereof.

4,477,695

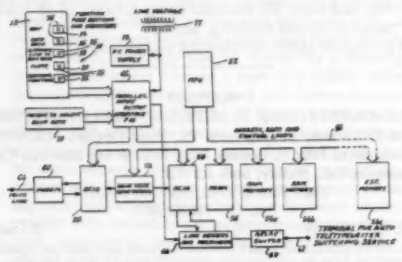
MICROPROCESSOR OPERATED TELECOMMUNICATIONS INTERFACE FOR A TERMINAL OF AN AUTOMATIC TELETYPEWRITER SWITCHING SERVICE

Robert J. Back, Fairfield, Conn., assignor to Electronic Mail Corporation of America, New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,476

Int. Cl.³ H04L *15/00, 3/00*

U.S. Cl. 178—3 **24 Claims**



13. A microprocessor operated telecommunications interface for connection to a telecommunications line to provide transmission of data between a terminal of an automatic teletypewriter switching service and a database, the interface comprising:

a microprocessing unit (MPU) for centrally controlling the functioning of the interface;

memory for operating said MPU;

a random access memory accessible by said MPU for storing message information, dialing information, and user identification information;

a telecommunications modem for converting digital information to information for telecommunications transmission, said telecommunications modem being connected to said telecommunications line;

means for formating and controlling serial asynchronous data communications information transmitted between said user terminal and said MPU;

at least two user-actuatable means for selecting a function of said interface, one said function selecting means accessing said MPU to said user terminal to provide for entry and editing of message information in said random access memory by said user terminal;

a second said function selecting means actuating said telecommunications modem to dial said database using said dialing information stored in said random access memory, said MPU transmitting user identification stored in said random access memory to said database, said MPU upon request by said database transmitting message information to said database; and

means for signaling that a message is available at said database, said MPU detecting a telephone ring at said telecommunications modem, said MPU sensing the amount of time elapsed since a last ring, said MPU after a predetermined amount of time, actuating said signal means to thereby signal the user that a message is available at said database.

4,477,696

CONFERENCE SYSTEM FOR TELEPHONY

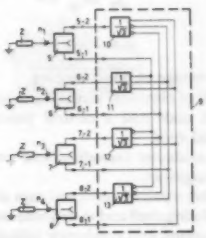
Adrianus W. M. van den Enden; Job F. P. van Mil, and Aloysius J. Nijman, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

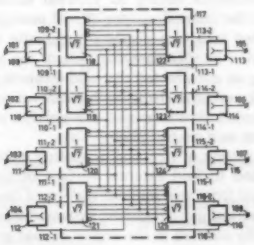
Filed Nov. 20, 1981, Ser. No. 323,621

Claims priority, application Netherlands, Dec. 1, 1980, 8006518

Int. Cl.³ H04M *3/56*

U.S. Cl. 179—18 BC **6 Claims**





1. A conference system for establishing a simultaneous interchange of information among a plurality of subscribers comprising a conference circuit for information signals of the conference, a plurality of connecting circuits, one for connecting each participant to the conference circuit, each connecting circuit being formed by an output circuit for transmitting information from a participant to the conference circuit and an input circuit for receiving information from the conference circuit for that participant, the conference circuit being arranged for receiving information signals from the output circuit if each of the connecting circuits and for applying information signals to the input circuit of each of the connecting circuits, the information signal applied to the input circuit of each

connecting circuit comprising the algebraic sum of the information signals received from the output circuits of each of the other connecting circuits with a predetermined phase and a predetermined amplitude ratio, each phase being chosen so that the matrix which represents the algebraic relationship between the information signals received from the output circuits and the information signal applied to each input circuit is determined by the relationship $E-S^*S\ \ 0$, wherein E is the unity matrix and S^* is the transposed, complex conjugate matrix of S.

4,477,697

METHOD AND CIRCUITRY FOR ENCODING TELEPHONE RINGING SIGNALS

Thomas H. Judd, Madison; Michael C. King, Freehold; Edmund T. Klemmer, Holmdel, and Martin H. Singer, Fair Haven, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 22, 1982, Ser. No. 443,391
Int. Cl.³ H04M *13/00*
U.S. Cl. 179—84 T **32 Claims**

1. A communication system including a control unit and a plurality of station sets connected thereto, each station having a capability of communication with other stations of the system, said system comprising:

means for dividing the active ring interval of an audible ringing signal into a first and a second segment,

means for generating during said first segment one of a first group of encoded audio tone signals each signal of said first group providing, respectively, different information of a first type about a received call, and

means for generating during said second segment of one of a second group of encoded audio tone signals each signal of said second group providing, respectively, different information of a second type about said received call.

4,477,698

APPARATUS FOR DETECTING PICK-UP AT A REMOTE TELEPHONE SET

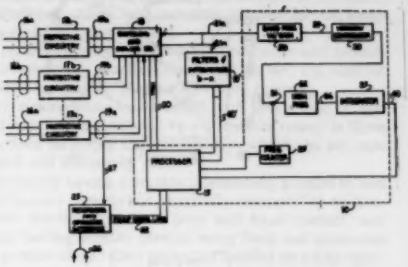
Aleksander Szlam, Marietta, and Chester P. Quinn, Chamblee, both of Ga., assignors to Melita Electronics Labs, Inc., Atlanta, Ga.

Filed Sep. 7, 1982, Ser. No. 415,711
Int. Cl.³ H04M *1/26*
U.S. Cl. 179—90 BD **3 Claims**

3. An improved apparatus for detecting audio information on a telephone line to detect a pick-up condition at a called party set comprising in combination:

preprocessing means connected to said telephone line for providing a digital signal in response to said audio information, said preprocessing means being responsive to cause said digital signal to be in a first state when an audio signal within a predetermined passband is present on said telephone line, and to be in a second state opposite said first state when said audio signal with said predetermined passband is absent from said telephone line,

digital signal processing means connected to said preprocessing means and responsive to said digital signal to measure and store each duration of each occurrence of a sequence of occurrences of said first state and said second state, each of said occurrences being of a duration exceeding a predetermined glitch duration, and to compare each said duration measured to a previously stored duration of an occurrence of the same state and to provide a pick-up



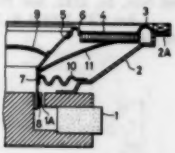
output signal condition in response to a said duration measured differing from said previously stored duration of said same state by at least a predetermined tolerance value.

4,477,699

MECHANICAL TWO-WAY LOUDSPEAKER

Yasumitsu Wada, and Isao Yamamuro, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 10, 1982, Ser. No. 356,702
Claims priority, application Japan, Mar. 24, 1981, 56-40289[U]
Int. Cl.³ H04R *1/24, 9/06*
U.S. Cl. 179—116 **14 Claims**



1. A mechanical two-way loudspeaker, comprising: a low frequency diaphragm for reproducing sounds in a low frequency range, a high frequency diaphragm for reproducing sound in a high frequency range, said high frequency diaphragm being arranged coaxially with said low frequency diaphragm, both of said diaphragms being driven by the same voice coil, said low frequency diaphragm being provided with a flat sound wave radiation surface entirely disposed in an area radially outward from an area in which said high frequency diaphragm is disposed.

4,477,700

TACTILE MEMBRANE KEYBOARD WITH ELLIPTICAL TACTILE KEY ELEMENTS

Frederick A. Balash, Mesa, and Mary T. Caton, Chandler, both of Ariz., assignors to Rogers Corporation, Rogers, Conn.

Filed Nov. 14, 1983, Ser. No. 551,470
Int. Cl.³ H01H *1/00, 13/70*
U.S. Cl. 200—5 A **11 Claims**

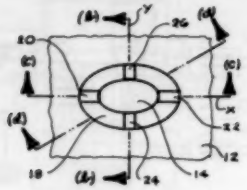
6. A keyboard comprising:

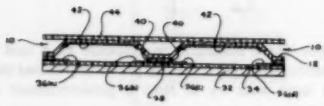
a sheet of base material;

a plurality of tactile elements formed in said sheet of base material, each of said tactile elements being an elliptical protrusion in said base material asymmetric with respect to a line or plane of reference;

first electrically conductive means associated with each tactile element; and

second electrically conductive means aligned with each of





said tactile elements, said first electrically conductive means contacting said second electrically conductive means to complete an electric circuit upon actuation of each of said tactile elements.

4,477,701

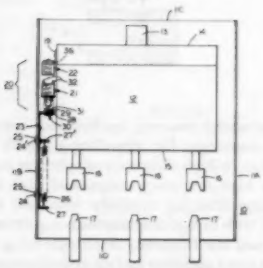
SECONDARY DISCONNECT PLUGS FOR PROGRAMMABLE CIRCUIT BREAKERS

Roger N. Castonguay, Terryville, and Charles L. Jencks, Avon, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Nov. 10, 1982, Ser. No. 440,642

Int. Cl.³ H01H *9/20*

U.S. Cl. 200—50 AA **10 Claims**



1. Secondary disconnect plugs for programable circuit breakers comprising:

A. contact plug means including a plurality of contact pins fixedly attached to an electric circuit breaker compartment or to the breaker to provide electrical connection between circuit elements within the breaker and a power source located within the compartment;

B. contact plug receptacle means including a plurality of corresponding contact pin holes for receiving said contact pins floatingly attached to the sidewall of the breaker compartment or to the sidewall of the breaker by means of centering pins contained within centering springs which maintain a cap at an end of said centering pins against a bracket, said bracket being slibably mounted on said circuit breaker compartment or said circuit breaker sidewall by means of slots for mating with said connector plug means and completing electrical connection between said circuit elements and said compartment power supply when said circuit breaker is in a test position within said compartment and line and load receivers on a back portion of said circuit breaker are disconnected from associated line and load plugs within said compartment as well as when said circuit breaker receivers are in electrical connection with said compartment plugs.

4,477,702

CLOSURE INDICATOR FOR THE DOOR OF A BALING PRESS

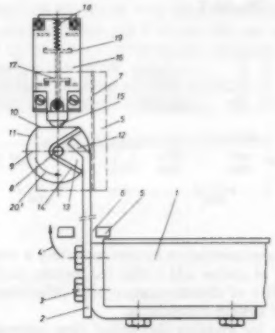
Albert Goldhammer, Überlingen, Fed. Rep. of Germany, assignor to Firma Feinwerktechnik Schleicher & Co., Markdorf, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,467

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112719

Int. Cl.³ H01H *3/16*

U.S. Cl. 200—61.62 **6 Claims**



1. A closure indicator in combination with a baling door of a baling press comprising: at least one switch finger disposed on the swingable part of said door, which switch finger is adapted to actuate at least one switching cam of electrical switch means disposed in said baling press, said switching cam having control surfaces in the form of a straight surface and a sector-shaped recess, the former of which is associated with the closed position of said door; a spring-loaded electrical switching element situated in line with said control surfaces of said cam; and said switch finger engaging or catching said sector shaped recess of said cam upon said door swinging into a closed position and actuating said cam.

4,477,703

TRIPPING DEVICE FOR THERMAL RELAYS

Jaime Reguant Soler, Tarrasa, Spain, assignor to Agut, S.A., Tarrasa, Spain

Filed Aug. 20, 1982, Ser. No. 409,963

Claims priority, application Spain, Jun. 14, 1982, 265.804[U]

Int. Cl.³ H01H *5/00, 15/18*

U.S. Cl. 200—76 **6 Claims**

1. A snap action device for use in tripping a thermal relay, said device comprising:

a sliding bar mounted for movement in opposite longitudinal directions;

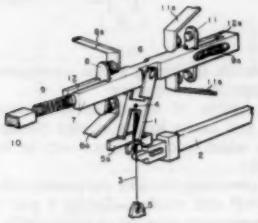
a pivotable member having a first end mounted for tilting movement at a fixed position and a second end articulated to said bar, such that tilting movement in opposite directions of said pivotable member at said first end thereof results in movement of said bar in respective said opposite longitudinal directions;

first and second fixed contacts positioned at respective positions spaced longitudinally of said bar;

first and second movable contacts mounted on said bar and movable therewith between a first longitudinal position of said bar, whereat said first movable contact is in contact with and closes said first fixed contact and said second movable contact is spaced from and opens said second fixed contact, and a second longitudinal position of said bar, whereat said first movable contact is spaced from and opens said first fixed contact and said second movable contact is in contact with and closes said second fixed contact;

means for urging said first and second movable contacts in directions toward said first and second fixed contacts, respectively;

means for biasing said pivotable member to pivot about said first end thereof in a first direction to move said bar to said first longitudinal position thereof, said biasing means comprising a tension spring having a first end connected to a mid portion of said pivotable member between said first and second ends thereof and a second end connected to a fixed position, said tension spring tilting said pivotable member in said first direction when said mid portion is spaced in said first direction from a rectilinear line between said second end of said tension spring and said first end of said pivotable member; and



means for stretching said tension spring in a direction to cause said pivotable member to tilt in a second direction opposite to said first direction until said mid portion is spaced in said second direction from said rectilinear line, whereat said tension spring then undergoes snap action and biases said pivotable member about said first end thereof in said second direction to move said bar to said second longitudinal position thereof.

4,477,704

POWER SWITCHING DEVICE

Teijiro Mori, Hyogo; Shigeru Masuda, Nagoya; Hiroyuki Okado, Nagoya; Masahiro Kakizoe, Nagoya, and Yuji Sako, Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1983, Ser. No. 461,362

Claims priority, application Japan, Jan. 28, 1982, 57-12211; Mar. 31, 1982, 57-52623; Mar. 31, 1982, 57-52624

Int. Cl.³ H01H *9/30*

U.S. Cl. 200—144 R **10 Claims**

1. A power switching device comprising:

a fixed contactor provided with a fixed contact;

a movable contactor provided with a movable contact opposed to said fixed contact, said movable contact being movably mounted for making and breaking contact with said fixed contact;

a deionizing grid disposed near said fixed and movable contactors, said grid acting to extinguish an electric arc which is developed when said movable contact moves away from said fixed contact; and

an arc runner disposed near said fixed contactor and extending continuously in a direction in which said arc runs for transferring said arc beyond said fixed contact;

said arc runner being constructed such that a side of said fixed contact is surrounded by a side of the runner in three directions including said direction in which the arc runs toward said deionizing grid,

said arc runner having a portion substantially parallel to said fixed contact close to but physically separated by an electrically insulating medium from said fixed contact, said runner having another portion being fixed and connected to a portion of said fixed contactor located on a side opposite to one on which said arc runs toward said deionizing grid with regard to said fixed contact; wherein said arc runner comprises a connecting portion fixed to said fixed contactor and an arc running portion having a horizontal section and a vertical section forming a continuous surface along which said arc runs to said deionizing grid, said vertical section located at an edge of said horizontal section remote from said fixed contact, said connecting portion being remote from said arc running portion.

4,477,705

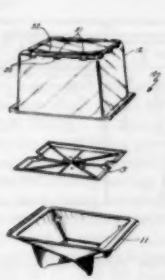
MICROWAVE OVEN POPCORN POPPER, STEAMER AND ROASTER

Allen M. Danley, Eagan, and Mark L. Steingraber, St. Paul, both of Minn., assignors to Plastics, Inc., St. Paul, Minn.

Filed Jun. 1, 1982, Ser. No. 383,695

Int. Cl.³ H05B *6/80*; A23L *1/18*

U.S. Cl. 219—10.55 E **27 Claims**



1. A cooking utensil for popping corn in a microwave oven cavity and serving the popped corn comprising:

a shallow, generally hollow, lower cooking member defining a pyramidal-shaped cavity with an open base;

stand means for orienting said lower cooking member in said microwave oven cavity with said open base being upwardly directed for defining an open top pyramidal-shaped lower heating chamber for retaining and heating unpopped corn kernels, said unpopped corn kernels being gravity biased into apexes defined by the intersections of the sidewalls of said pyramidal-shaped heating chamber whereby efficient heating of said unpopped kernels is facilitated;

a combined cover and serving container;

support means for supporting a combined cover and serving container about the periphery of said lower cooking member;

a handle means for defining a handle disposed at the juncture of said cover and serving container and said lower cooking member;

said cover and serving container comprising a deep, generally hollow, upper member defining a roughly cube-shaped cavity with one open side, said support means orienting said cover and serving container relative to said lower cooking member such that said open side of roughly cube-shaped cavity communicates with said open top of said pyramidal-shaped lower heating chamber to define an upper chamber for receiving and storing popped corn kernels upwardly and away from said heating chamber whereby scorching of said popped kernels is reduced; and

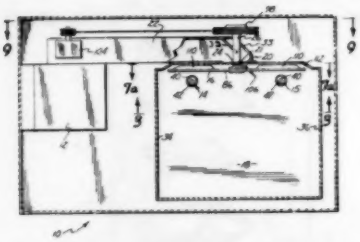
vent means disposed in said cover and serving container remote form said handle means for venting said upper chamber to the atmosphere without heating said handle means, said vent means comprises a plurality of apertures, each of the apertures being disposed in a side of said cover and serving container at the terminus of each one of a plurality of channels extending from the side opposite to said open side and down the sides of said cover and serving container to provide for the use of said cover and serving container as a serving container while minimizing the loss of popcorn through said vent means.

4,477,706

COMBINATION MICROWAVE/CONVECTION AND BROILING OVEN

Robert A. Mittelsteadt, Burnsville, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Jul. 19, 1982, Ser. No. 399,409
Int. Cl.³ H05B 6/72
U.S. Cl. 219—10.55 B 13 Claims



1. A combination microwave/convection/infrared oven comprising:

a cavity having three walls, a roof and a floor;

a recess formed in said roof, said recess including an entry port;

microwave generation means;

waveguide means for guiding microwaves from said generation means to said cavity via said entry port located in the recess of the roof;

heat-exchanger/fan means rotatably mounted on the interior roof of said cavity in said recess; the fan means comprising a substantially circular disk having one or more centrally located apertures and impeller means for drawing air up through said one or more central apertures and blowing it out the periphery of the circular disk;

infrared generation means mounted directly below, relative to said roof, said heat-exchanger/fan means;

blinder means cooperatively mounted on said infrared generation means for blocking infrared directed in one direction while allowing propagation in the other direction;

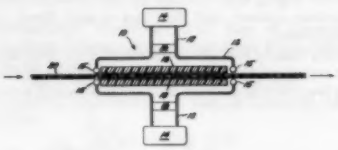
means for changing the orientation of said blinder means vis-a-vis said exchanger/fan means.

4,477,707

ELECTROMAGNETIC FIELD HEATING APPARATUS FOR CURING RESIN/FIBER COMPOSITES IN CONTINUOUS PULTRUSION PROCESSES

Wontaik Kim, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 24, 1982, Ser. No. 444,273
Int. Cl.³ H05B 9/06
U.S. Cl. 219—10.55 A 10 Claims



1. An apparatus, for curing a resin-impregnated fiber workpiece, said apparatus comprising:

a cavity capable of supporting electromagnetic waves therein, said cavity having at least one aperture therein through which said workpiece may be introduced and removed;

means for generating standing electromagnetic waves within said cavity, said means including a pair of microwave enegry generators disposed on substantially opposite sides of said cavity, said energy generators operating at the same frequency and configured so as to operate in a phase shift relationship of approximately 180°.

9. A method for curing a resin-impregnated fiber mass, said method comprising:

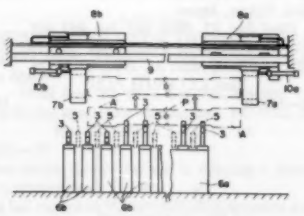
subjecting said mass to a substantially uniform field of microwave electromagnetic energy, said uniform field being provided by a pair of electromagnetic wave-generating means operating in a phase shift relationship of 180° and at the same frequency.

4,477,708

APPARATUS FOR PREHEATING THE ENDS OF UPSET STEEL PIPES

Shigeru Sano, Yokosuka; Katsumi Sakurai, Kawasaki; Tatsuo Ono, Yokohama; Kanji Tsuruoka, Kamakura, and Masaru Watanabe, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1982, Ser. No. 398,812
Claims priority, application Japan, Jul. 24, 1981, 56-115388
Int. Cl.³ H05B 6/40
U.S. Cl. 219—10.67 4 Claims



1. An apparatus for preheating the ends of an upset steel pipe comprising support base blocks for vertically movably supporting the upset steel pipe, at least one pair of induction heating coils being arranged above said support base blocks for simultaneously heating both ends of the upset steel pipe in the raised position of said support base blocks, a carriage movable for displacing at least one of the coils to a spacing corresponding to the length of the steel pipe, and means for axially moving

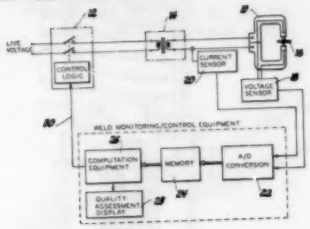
said induction heating coils with variable strokes adjusted relative to the length of the upset portions of the upset steel pipe wherein said support blocks may be raised and lowered separately and selectively.

4,477,709

METHOD AND APPARATUS FOR DETECTING EDGE WELDS DURING RESISTANCE SPOT WELDING

Dixon Cleveland, Vienna, Va.; James R. Havens, Sterling Heights; Gregory L. Nagel, Royal Oak, both of Mich.; Basil A. Decina, Jr., McLean, Va., and William C. Jenuwine, Washington, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 25, 1983, Ser. No. 498,062
Int. Cl.³ B23K *11/24*
U.S. Cl. 219—109 **6 Claims**



1. The method of monitoring a resistance spot weld and determining whether the weld occurs at the edge of a sheet, comprising the steps of:

measuring the weld resistance as the weld is being made,

analyzing the resistance to detect a parameter representing the onset of melting,

detecting expulsion time by searching for first and second points marking the beginning and end of expulsion respectively, the points occurring after the onset of melting when the rate of resistance change drops below a preset threshold and then increases above the threshold respectively, and measuring the time between the first and second points,

measuring the time between the onset of melting and the end of expulsion,

searching the rate of resistance change between the first and second points for an inflection point in the resistance drop, and

predicting an edge weld when an inflection is present and the ratio of the expulsion time to the time from the onset of melting to the end of expulsion exceeds a specified value.

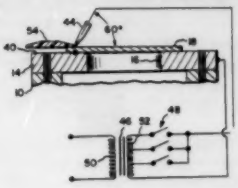
4,477,710

METHOD OF FORMING A HIGH TEMPERATURE, HIGH PRESSURE THIN FOIL SEAL

Gerald A. Zawadzkas, Elizabeth, and Mau-Song Chou, Mountainside, both of N.J., assignors to University of Rochester, Rochester, N.Y.

Continuation of Ser. No. 873,345, Jan. 30, 1978, abandoned. This application Oct. 10, 1979, Ser. No. 83,427
Int. Cl.³ B23K *11/08*
U.S. Cl. 219—117.1 **2 Claims**

1. The method of sealing an opening in a metallic member with a flimsy metal foil which comprises the steps of applying in air a stationary film of water over a surface of said metallic member in which said opening is disposed, then placing said foil upon said film on said surface across said opening such that foil is drawn against said surface, supporting said foil with the aid of a second member disposed on the side of said foil which faces away from said surface and extends over said opening, and then electrically welding said foil to said metallic member



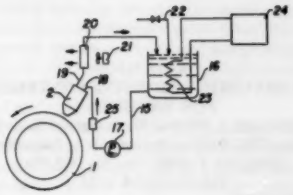
along a path extending about said opening and inward from the edge of said foil.

4,477,711

METHOD AND APPARATUS FOR PLASMA WELDING

Takao Mihara, Matsubara; Toshiaki Morichika, Hirakata, and Shigenori Sone, Nara, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Division of Ser. No. 251,058, Apr. 6, 1981, Pat. No. 4,371,775. This application Oct. 29, 1981, Ser. No. 316,396
Claims priority, application Japan, Apr. 23, 1980, 55-54802
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—121 PJ **1 Claim**



1. A plasma welding equipment comprising a plasma welding torch having a cooling water jacket surrounding an electrode and a center gas passage, a detector for sensing the temperature of the cooling water being provided at an inlet of the jacket and communicating with means for starting a plasma arc, and a cooling water circulating passage having a means for cooling water and a pump being connected to the plasma welding torch, the means for cooling water being controlled by the temperature detector to maintain the cooling water at the said inlet at a predetermined temperature range of more than 4° C. and less than 18° C., and the means for starting the plasma are being arranged to start the arc when said predetermined temperature is reached.

4,477,712

ARC-WELDING SEAM-TRACKING APPLICATIONS EMPLOYING PASSIVE INFRARED SENSORS

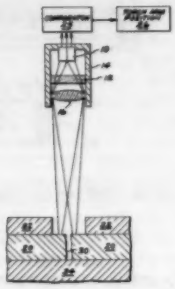
Robert D. Lillquist, and Carl M. Penney, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,708
Int. Cl.³ B23K *9/12*
U.S. Cl. 219—124.34 **1 Claim**

1. A method for seam-tracking along a workpiece in a moving arc torch welding operation comprising the steps of:

determining the level of emitted infrared radiation in the infrared radiation band having wavelengths greater than about 3 microns, said infrared radiation being determined for at least two points which are substantially equidistant from said seam, said points being positioned on opposite sides of said seam with respect to the direction of travel of said arc torch;

comparing, by generating a difference signal, the level of emitted infrared radiation in said band from said opposite sides of said seam; and



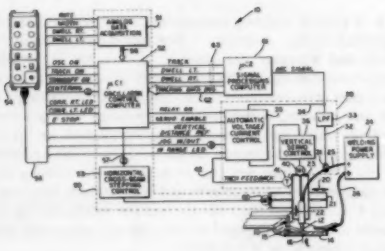
laterally positioning said arc torch so as to reduce the level of said difference signal.

4,477,713

SIDEWALL-MATCHING ADAPTIVE CONTROL SYSTEM FOR WELDING

George E. Cook, and A. Michael Wells, both of Nashville, Tenn., assignors to CRC Welding Systems, Inc., Nashville, Tenn.

Filed Jul. 9, 1982, Ser. No. 397,006
Int. Cl.³ B23K 9/12
U.S. Cl. 219—124.34 27 Claims



1. In an apparatus for arc welding a joint in a workpiece, said apparatus including arc cross-seam moving means for oscillating an electrode laterally across the joint about a predetermined center reference point between a left extreme and a right extreme, the improvement comprising: noncontacting means for sensing the lateral profile of the joint by periodically holding the electrode vertically stationary while the electrode is moving laterally across the joint between and including said extremes of oscillation and for obtaining data representative of the weld joint lateral profile between said extremes;

means for comparing a first portion of said representative weld joint lateral profile data to a second portion of said representative weld joint lateral profile data and for providing an error signal as a function of the difference between said first and said second portions; and

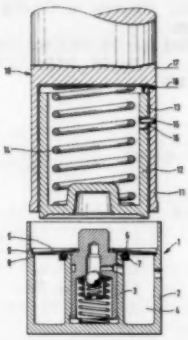
means responsive to said error signal for adjusting a welding parameter.

4,477,714

METHOD OF LEAK PROOF ATTACHMENT OF A FLANGE-TYPE SHEET METAL ELEMENT IN THE BORE OF A VALVE TAPPET

Helmut Zorn; Karl Spiess, and Wenzel Bina, all of Herzogenaurach, Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Jan. 19, 1983, Ser. No. 459,107
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1982, 3203439
Int. Cl.³ B21J 1/06; H05B 1/00; B21D 53/00; B21K 29/00
U.S. Cl. 219—149 3 Claims



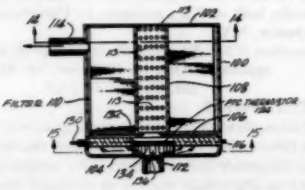
1. A method of leak proof attachment of the outer edge of a flange-type sheet metal element in the bore of a steel cup-shaped valve tappet acting as a hydraulic play-compensating element for a combustion engine comprising (a) reducing the diameter of the bore of the valve tappet in two stepped portions from the open end, the axial spacing of the two stepped portions being greater than the thickness of the sheet metal element, (b) placing the outer edge of the sheet metal element on the innermost stepped portion and simultaneously axially applying pressure on the outermost stepped portion with an outer die and on the sheet metal element with a hold-down ram with said die being electrically insulated from said ram, and (d) heating by electric resistance with leads connected to the die and the hold-down ram causing the pressure applied by said outer die to plastically deform inwardly the outermost stepped portion thereby capturing the sheet metal element between said inwardly deformed outermost stepped portion and said innermost stepped portion.

4,477,715

PTC THERMISTOR CONTROLLED ELECTRIC DIESEL FUEL HEATER

Lon E. Bell, and William P. Gruber, both of Altadena, Calif., assignors to Technar Incorporated, Arcadia, Calif.

Filed Jul. 19, 1982, Ser. No. 399,337
Int. Cl.³ H05B 1/02; F02M 31/00; F23D 11/44; F24H 1/10
U.S. Cl. 219—205 3 Claims



1. A fuel heater for diesel fuel comprising electrical resis-

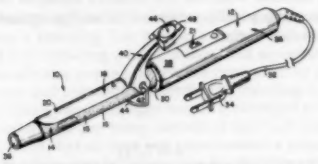
tance heater means, thermistor means having a positive temperature coefficient of resistance, means for directing an electric current through the heater means and thermistor means in series, means directing fuel successively past the thermistor means and the heater means, the heater means and thermistor means being in heat exchanging proximity to the fuel, the heater means including a heater element having openings through which the fuel passes, and the thermistor means comprising a flat thin disk mounted at the center of the heater element.

4,477,716

FLOCKED CURLING IRON

Arnold Thaler, Plantation; David Friedson, Miami, both of Fla., and Lai Kin, Kowloon, Hong Kong, assignors to Windmere Corporation, Hialeah, Fla.

Filed Jul. 12, 1982, Ser. No. 397,169
Int. Cl.³ H05B 1/00; A45D 1/02
U.S. Cl. 219—225 **3 Claims**



1. A hair curling iron comprising:
a heat conductive cylinder having an exterior surface and a hollow center, the exterior surface being flocked;
a handle joined to said cylinder;
a heating element disposed within said hollow center of said cylinder;
electrical means capable of electrically activating said heating element when coupled to a source of electrical power; and
a clamping means having a partial cylindrical section having inner and outer surfaces with said inner surface biased against said flocked outer surface of said cylinder, and centered so as to partially wrap around and mate with said outer surface of said cylinder, said inner surface of said clamp being flocked and said outer surface of said clamp being flocked, said clamping means further comprising:
a projection joined to said clamp which extends from said partial cylindrical section toward the handle; and
a spring having two ends, the ends respectively engaging said handle and said projection, said spring being compressed so that said inner surface of said partial cylindrical section is biased against said outer surface of said cylinder.

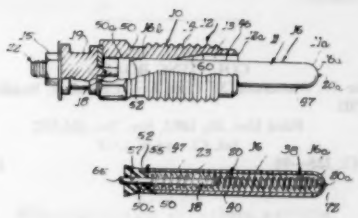
4,477,717

FAST START GLOW PLUG

Frank T. Walton, Shelbyville, Ind., assignor to Wellman Thermal Systems Corporation, Shelbyville, Ind.

Filed Apr. 8, 1983, Ser. No. 483,365
Int. Cl.³ F23Q 7/22; F02P 19/00
U.S. Cl. 219—267 **7 Claims**

1. A glow plug comprising:
an outer metal housing having a wall defining an internal axially extending bore,
a tubular heater having an external tubular sheath of metal with a heated end of the sheath extending outwardly of the housing and an opposite internal end within the housing bore, said sheath being structurally secured and electrically connected to the metal housing, said sheath having a closed outer end,
an electrical heating element positioned within the heater sheath and electrically connected to the tubular sheath and having a conductor extending outwardly from the other end of the sheath,
electrical insulating material filling the space between the heating element and the sheath, and
an insulative compressible washer member compressed between the sheath and the conductor to provide a first interference fit seal to prevent the flow of gas between the sheath and conductor and into the interior of the tubular heater,
the wall defining the axially extending bore including an upper tapered section being of reduced diameter in the upward direction to compress the insulative compressible



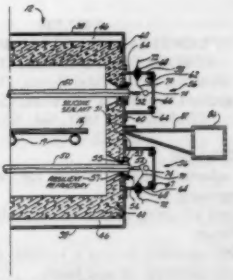
washer member as the tubular heater is forced further into the housing bore and including an upper cylindrical section thereabove of a diameter smaller than the inlet side of the tapered section engaging and compressing the compressible washer member to form a tight second interference fit seal between the housing and the tubular sheath to further upward flow of gas,
an upper end on said sheath compressed by said tapered section and then by said upper cylindrical section of said wall and having metal-to-metal contact therewith, said compressible washer member abutting and extending radially outwardly across the upper end of said sheath.

4,477,718

INFRARED FURNACE WITH CONTROLLED ENVIRONMENT

Norman R. Crain, Huntington Beach, and Robert P. Hardison, Tustin, both of Calif., assignors to Radiant Technology Corporation, Cerritos, Calif.

Filed Jan. 10, 1983, Ser. No. 456,564
Int. Cl.³ F27B 9/06; F27D 11/02
U.S. Cl. 219—388 **13 Claims**



1. An infrared furnace comprising:
an insulated firing chamber with oppositely disposed sidewalls having a plurality of aligned pairs of holes and oppositely disposed top and bottom walls, the sidewalls and top and bottom walls defining a horizontal, elongated passage from an entrance to an exit;

a product conveyor extending through the passage from the entrance to the exit;

a plurality of infrared lamps disposed in the chamber, the lamps having end terminals passing through the respective hole pairs to the exterior of the chamber;

first means for introducing a non-reactive gas to the passage;

compartment means enclosing the end terminals of the lamps on the exterior of the chamber, the compartment means being sealed against intrusion from the atmosphere outside the furnace; and

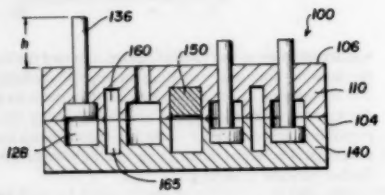
second means for introducing to the compartment means a non-reactive gas under more pressure than in the passage to induce flow of said gas through the holes into the firing chamber.

4,477,719

COUNTING BOARD

Walter W. Watterson, 31 Vista Ave. Extension, Bradford, Pa. 16701

Filed Dec. 30, 1982, Ser. No. 454,532
Int. Cl.³ A63F 1/18
U.S. Cl. 235—90 **6 Claims**



2. In a cribbage board having longitudinally spaced rows of peg-receiving apertures formed on a top panel, pegs being inserted into said apertures so as to be selectively adjustable to extend above the upper surface of said top panel by at least two different heights, the improvement comprising:

said pegs being formed from magnetically attractive material;

a magnetic attraction means attached to said cribbage board and aligned with said peg-receiving aperture rows such that said pegs will be maintained by magnetic attractive forces at any of said selectively adjustable heights above said upper surface; and

said top panel being connected to a bottom panel and forms a recess therebetween wherein said magnetic means may be disposed.

4,477,720

ADAPTIVE OPTICAL SYSTEM HAVING AUTOMATIC FEEDBACK APERTURE CONTROL

James E. Pearson, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1981, Ser. No. 333,083
Int. Cl.³ G01J 1/20
U.S. Cl. 250—201 **3 Claims**

1. An adaptive optical system for controlling an optical beam conprising:

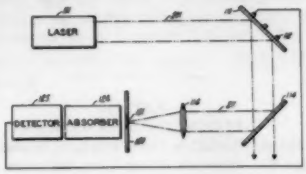
wavefront adjusting means for controlling the wavefront of said beam;

a variable aperture having a variable diameter for controlling the diameter of said beam;

measurement and control means responsive to the optical beam power passing through said variable aperture for controlling said wavefront adjusting means, in which;

said variable diameter is greater than the diameter of the Airy disk of said optical beam when said beam is initially switched on and said variable diameter is subsequently reduced to a diameter less than said Airy disk diameter, characterized in that:

said variable aperture is formed by a fixed aperture having a diameter greater than said Airy disk, together with a filter medium disposed between said fixed aperture and said



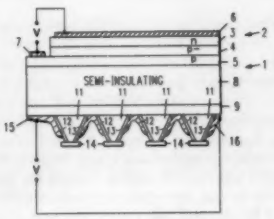
measurement means, said filter medium having the property that the transmissivity of said filter medium is a monotonic function of the intensity of optical radiation impinging thereon, whereby the effective diameter of said aperture automatically varies in size as the optical quality of said beam varies.

4,477,721

ELECTRO-OPTIC SIGNAL CONVERSION

Terry I. Chappell, Amawalk, N.Y.; Dieter W. Pohl, Adliswil, Switzerland, and Jerry M. Woodall, Bedford Hills, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 22, 1982, Ser. No. 341,955
Int. Cl.³ H01J 40/14
U.S. Cl. 250—211 J **6 Claims**



1. A signal conversion structure comprising in combination

a direct bandgap monocrystalline semiconductor body having

a photon transparent electrically insulating region with essentially parallel first and second major surfaces separated by a dimension that is less than will attenuate photon transport,

a first photon conversion means essentially coextensive and epitaxial with said first major surface of said insulating region,

a crystal lattice accommodation region having first and second major surfaces, said first surface being epitaxial with and essentially coextensive with said second major surface of said insulating region, and

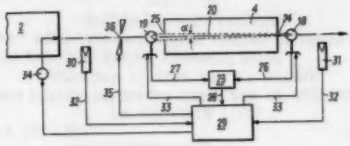
a second photon conversion means being essentially coextensive with said second surface of said lattice accommodation means, said second photon conversion means further including a plurality of epitaxial photon conversion segments, each having a photon conversion region oblique to a photon travel path through said insulating region from said first photon conversion means.

4,477,722

MONITORING EQUIPMENT WHICH SWIVELS INTO AND OUT OF A TRAVELING LINE

Harald Brandl; Reinhard Dolc, both of Donawitz, and Klaus Kammerhofer, Leoben, all of Austria, assignors to voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Dec. 7, 1981, Ser. No. 328,394
Claims priority, application Austria, Dec. 16, 1980, 6133/80
Int. Cl.³ G01V 9/04
U.S. Cl. 250—222.1 5 Claims



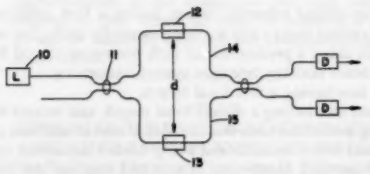
1. Monitoring equipment for material being processed as it moves along a traveling line having a supply end and a discharge end and including a drive means, said equipment comprising opto-electric sensors which are connected to an interpreting circuit and to a control unit for the traveling line characterized in that at least one light source is arranged at one end of the traveling line for being swivelled into and out of the travelling line in that at least one photosensitive sensor is arranged at the other end of the traveling line for being swivelled into and out of the travelling line, in that the light source and the sensor are connected with a pivotal drive for swivelling them into and out of the traveling line, in that at least one additional detector for the material to be processed is arranged at one end of the traveling line, the signals of said detector being supplied to a control unit which is in connection with said pivotal drive.

4,477,723

FIBER OPTIC ELECTRIC FIELD SENSOR/PHASE MODULATOR

Edward F. Carome, South Euclid, Ohio, and Charles M. Davis, McLean, Va., assignors to Optical Technologies, Inc., McLean, Va., a part interest

Filed Nov. 4, 1981, Ser. No. 318,094
Int. Cl.³ G02B 5/14
U.S. Cl. 250—227 26 Claims



1. An antenna system for receiving r.f. electric fields, the system comprising:

(a) a source of coherent light;

(b) at least a first and a second optical fiber operatively connected with the coherent light source for transmitting coherent light therefrom;

(c) photodetector means operatively connected with the optical fibers for detecting the coherent light transmitted therethrough; and,

(d) an electric field-responsive sensor operatively connected with at least the first optical fiber, the sensor including:

(i) an electric field receiving piezoelectric element which is unshielded by electrodes such that electric fields are free to impinge directly thereon, the piezoelectric element being poled such that the incident electric fields cause corresponding length changes in the piezoelectric element,

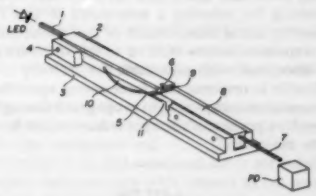
(ii) means for attaching the piezoelectric element to the first optical fiber such that the length changes of the piezoelectric member cause a corresponding length changes of the first optical fiber, whereby the incident electric fields change the length of the optical path between the coherent source and the photodetector means through the first optical fiber which, in turn, changes the relative phase of the coherent light transmitted through the first and second optical fibers in correspondence to the incident electric field.

4,477,724

PHOTOELECTRIC CONTROL DEVICE

Alan L. Harmer, Plan les Ouates, Switzerland, assignor to Battelle Memorial Institute, Carouge, Switzerland

Filed Jul. 1, 1982, Ser. No. 394,109
Claims priority, application European Pat. Off., Jul. 6, 1981, 81810273.3
Int. Cl.³ G02B 5/14
U.S. Cl. 250—227 4 Claims



1. A photoelectric control device comprising a light source, a photodetector, a switch actuated by the photodetector, the on/off condition of this switch being dependent on a light intensity threshold detected by the photodetector, an actuating element adapted to be displaced between two limit positions, a first optical fibre rigid with the actuating element, having first and second ends of which the first end is displaceable laterally by the said displacement of the actuating element and is bevelled obliquely to the direction of the displacement, a second optical fibre having first and second ends of which the first end is adjacent to the first end of the first optical fibre and is bevelled at an angle supplementary to the angle at which the first optical fibre is bevelled, said second ends being disposed to receive light from the light source and to transmit light to the photodetector, respectively, said optical fibres and actuating element being so disposed that in a first limit position of the actuating element the first ends of the fibres are parallel and in optical contact and the adjoining end regions of the fibres are coaxial whereby a light transmission path is established from the light source through the fibres to the photodetector, and in the other limit position the said first ends are separated whereby the light path is broken and light from the source is reflected laterally at the first end of the optical fibre associated therewith, a window being provided for observation of such laterally reflected light.

4,477,725

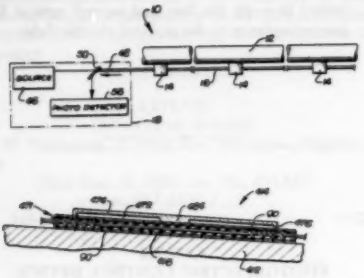
MICROBENDING OF OPTICAL FIBERS FOR REMOTE FORCE MEASUREMENT

Charles K. Asawa, Pacific Palisades; Joseph W. Austin, Torrance; Michael K. Barnoski, Pacific Palisades; Allan R. Jackson, Lawndale; Stewart D. Personick, Pacific Palisades, and Shi-Kay Yao, Anaheim, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Aug. 27, 1981, Ser. No. 297,050

Int. Cl.³ G02B *5/14*

U.S. Cl. 250—231 R **37 Claims**



30. A microbend transducer for use in detecting a force acting upon a structure, comprising:

a cable having an optical fiber, a protective sheathing encasing said fiber, and an elongated wire wound spirally about said fiber with predetermined longitudinal spacing between turns and interposed between said fiber and said sheathing for inducing a microbend in said fiber in response to lateral compression of said cable; and

force responsive means secured to the structure and operably associated with said cable for laterally compressing said cable in response to a force acting upon the structure to cause attenuation of light propagated through said fiber whereby a portion of the light is transmitted from the fiber at the microbend.

4,477,726

POSITION MEASURING APPARATUS UTILIZING FLEXIBLE STEEL BAND CONTAINING GRID DIVISIONS

Alfred Reichi, Stein, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Sep. 24, 1981, Ser. No. 305,188

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1980, 3038716

Int. Cl.³ G01B *3/10, 11/02*

U.S. Cl. 250—237 G **12 Claims**

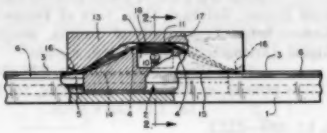
1. An encapsulated electric position measuring apparatus comprising:

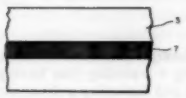
a carrier body;

a flexible covering band supported in place by the carrier body and lying longitudinally on said carrier body in sealing contact therewith, said band adapted to conform to said carrier body to seal portions of the carrier body from environmental influences, said band defining a measuring scale;

a scanning component adapted to move along the band, at least a portion of said scanning component being disposed between the band and the carrier body to scan the measuring scale; and

means for holding the band in position with respect to the carrier body and the scanning component such that said band, carrier body, and scanning component cooperate simultaneously to form a seal against dust and spray in order to protect said portions of the carrier body and the scanning component from environmental influences, and to protect the entire measuring scale at one side of the





band from environmental influences throughout the range of travel between the scanning component and the band.

4,477,727

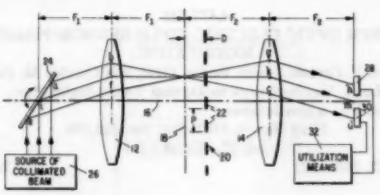
BEAM POSITION DETECTION SYSTEM FOR USE IN AN OPTICAL SCANNING SYSTEM

Mayer Rud, Reseda, Calif., assignor to The Singer Company, Stamford, Conn.

Filed Sep. 27, 1982, Ser. No. 423,773

Int. Cl.³ G02B *27/17*; H01J *3/14*

U.S. Cl. 250—237 G **9 Claims**



1. In an optical scanning system having a first collimated beam of radiant energy and scanning means for deflecting said first beam along a predetermined path transverse to said first beam, a beam position detection system comprising:

a first lens having a first focal length;

a second lens having a second focal length, said second lens being positioned such that the optical axes of said first and second lenses coincide and being further positioned such that the back focal plane of said first lens and the front focal plane of said second lens coincide;

means for generating a scanned second collimated beam of radiant energy moving in synchronism with said first beam and arranged so that the center of the second beam scanning means is within the entrance pupil of said first lens;

a planar grating member positioned between said first and second lenses a fixed distance from the coincident back focal plane of said first lens and front focal plane of said second lens, said planar grating member being substantially perpendicular to said optical axis and having a plurality of equi-spaced parallel linear bars substantially perpendicular to the second beam scanning direction;

a pair of radiant energy sensitive elements positioned within

the image of said first lens entrance pupil as reimaged by said first and second lenses, said radiant enregy sensitive elements being on opposite sides of said optical axis relative to the second beam scanning direction, each of said radiant energy sensitive elements providing a respective output signal in response to the impingement thereupon of radiant energy from said second beam; and

means for utilizing the output signals from said radiant energy sensitive elements to determine the position of said first beam.

4,477,728

RADIATION DETECTOR

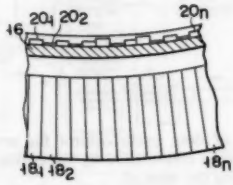
Toshihiro Rifu, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 15, 1981, Ser. No. 302,455

Claims priority, application Japan, Sep. 18, 1980, 55-129464

Int. Cl.³ G01T 1/185

U.S. Cl. 250—385 **11 Claims**



1. A radiation detector for sensing radiation transmitted through a subject to be examined comprising:

a body;

a plurality of radiation detection cells arranged side-by-side along the length of the body for converting radiation recieved by the respective cells into electrical signals representative of the radiation absorption properties of the subject, not all of the plurality of radiation detection cells having identical radiation detection characteristics;

a radiation permeable window formed over the plurality of radiation detection cells, and

a plurality of filters of radiation absorbing material mounted on the radiation permeable window, said filters being aligned with respective radiation detection cells for adjusting the intensity of radiation incident on each respective cell, each respective filter having a radiation absorbing property that standardizes the radiation detection characteristics of the respective cell with which it is aligned so that when the detector receives a standard dosage of radiation, each cell will produce the same electrical signal.

4,477,729

CONTINUOUSLY WRITING ELECTRON BEAM STITCHED PATTERN EXPOSURE SYSTEM

Tai-Hon P. Chang, Chappaqua, and Alan D. Wilson, Mt. Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 1, 1982, Ser. No. 432,170

Int. Cl.³ H01J 37/304, 37/302

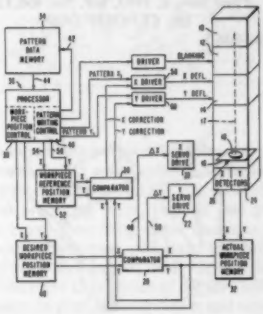
U.S. Cl. 250—492.2 **11 Claims**

1. Apparatus for writing a pattern having a size larger than the maximum writing field of a writing beam, comprising:

means for generating a writing beam which may be positioned anywhere within a maximum writing field,

pattern data defining a desired pattern to be written which is larger than said maximum writing field, said pattern data being partitioned into successive sets of subpattern data, said successive sets of subpattern data defining adjacent subpatterns to be successively written without interruption, each subpattern having a reference position for the workpiece associated therewith, any two successive subpatterns together being no larger in any dimension than said maximum writing field;

workpiece position data associated with said pattern data and defining successive desired positions of a workpiece with respect to said maximum writing field, said desired successive workpiece positions being spaced from each other by distances which are small in comparison with the size of said subpatterns said successive desired workpiece positions being such that said subpatterns to be successively written without interruption, when referenced to the workpiece, always lie within said maximum writing field if the workpiece is positioned at the currently desired workpiece position associated with the pattern data being



written or at a position in transit to said currently desired workpiece position from the previously desired workpiece position;

servo means tending to automatically keep a workpiece at the desired successive workpiece position;

means for continuously measuring the actual position of the workpiece;

means for measuring the error between the measured actual position of the workpiece and the current reference position for the workpiece and

means responsive to said measured error for referencing a subpattern being written with respect to the workpiece,

whereby no interruption in pattern writing is required for workpiece movements.

4,477,730

LASER APPARATUS

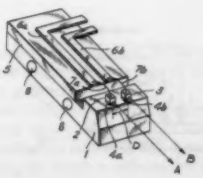
Hirokazu Fukuda, Akashi; Koji Shinohara, Kobe; Yoshio Kawabata, Takasago; Yoshito Nishijima, and Kosaku Yamamoto, both of Kobe, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 6, 1982, Ser. No. 366,060

Claims priority, application Japan, Apr. 9, 1981, 56-54706; Jan. 25, 1982, 57-10556

Int. Cl.³ G01J 3/10

U.S. Cl. 250—504 R **8 Claims**



1. Laser apparatus having cooling means, a cooling stem supporting member coupled to said cooling means and an

infrared laser element consisting of a lead-chalcogenide semiconductor mounted on said cooling stem and emitting an infrared beam, said laser apparatus comprising

a visible light emitting semiconductor element mounted on said cooling stem spaced from said infrared laser element by a predetermined distance and emitting a visible light beam in parallel with and in the same direction as the infrared beam emitted by said infrared laser element.

4,477,731

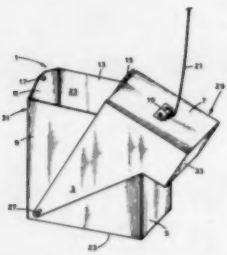
SELF-CLOSING SHIELDED CONTAINER FOR USE WITH RADIOACTIVE MATERIALS

Jay E. Smith, Pittsburgh, Pa., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Nov. 1, 1982, Ser. No. 438,127

Int. Cl.³ G21F *5/00*

U.S. Cl. 250—506.1 **5 Claims**



1. A container for storage of radioactive material comprising a container body having a bottom wall, opposed side walls and opposed front and rear walls defining a receptacle open at its upper end; and a closure member including a cover, and opposed side walls extending from said cover, means for coupling said closure member and said container body one to the other to enable said closure member to move between a first position with said cover substantially closing said receptacle opening and a second position with said cover displaced from said opening permitting access to said container body, said coupling means being located relative to said closure member and said container body to enable the closure member to move from said first position to said second position absent an applied force.

4,477,732

SENSOR FOR ACCELERATION

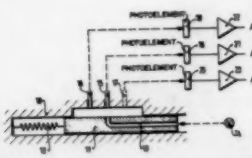
Eberhard Mausner, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 16, 1983, Ser. No. 505,007

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1982, 3231800

Int. Cl.³ H01H *35/14*; B60R *21/02*; G08B *21/00*

U.S. Cl. 307—9 **6 Claims**



1. A sensor for detecting acceleration, in particular for triggering passenger protection devices in motor vehicles, comprising a spring-restrained inertial mass the deflection of which is measured with reference to a fixed reference point upon the action of an acceleration thereon, said mass including a first photoconductor, one end of which is acted upon by a light source and the other end of which is located opposite further photoconductors connected to respective photo detection means in dependence upon the deflection of said mass, and means generating a trigger signal in response to said detection means upon the exceeding of an acceleration threshold value.

4,477,733

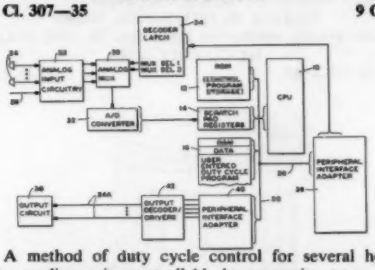
TEMPERATURE DEPENDENT DUTY CYCLER CONTROL SYSTEM

James R. Herdeman, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 18, 1982, Ser. No. 434,992

Int. Cl.³ H02J *3/00*

U.S. Cl. 307—35 **9 Claims**



1. A method of duty cycle control for several heating and/or cooling units controllable by respective temperature sensors, comprising the steps of:

providing a temperature dependent duty cycle locus for each of said units characterized by a reference period and a variable length running time, said running time being complementary to a variable length shed time;

maintaining status records for each said unit of its running/shed condition and the expiration of its shed time;

periodically making first and second scanning passes of said status records;

during said first pass determining for each said unit whether it is running and if not whether its shed time has expired;

during said first pass starting said units having expired shed times;

summing shed time percentages based on the shed times of said units and said reference period to calculate an ideal number of said units which should be shed at a given time;

maintaining a sum having an initial value of zero of fractional portions of successively calculated ideal numbers of said units which should be shed;

maintaining a priority order of rotation of units available to be shed; and

during said second pass shedding units in accordance with said priority order of rotation, the number of units shed being equal to the integral portion of said ideal number plus the integral portion said sum of fractional portions of successively calculated ideal numbers.

4,477,734

CONTROL SYSTEM FOR EDDY CURRENT COUPLING DRIVE FOR ARMOURED FACE CONVEYORS

Robert S. Graham, Wishaw, United Kingdom, assignor to Anderson Strathclyde PLC, Glasgow, Scotland

PCT No. PCT/GB82/00260, § 371 Date May 12, 1983, § 102(e) Date May 12, 1983, PCT Pub. No. WO83/01131, PCT Pub. Date Mar. 31, 1983

PCT Filed Aug. 31, 1982, Ser. No. 495,348

Claims priority, application United Kingdom, Sep. 17, 1981, 8128132

Int. Cl.³ H01H *35/06*

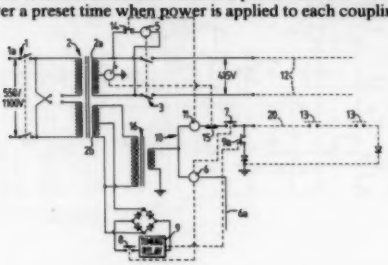
U.S. Cl. 307—120 **4 Claims**

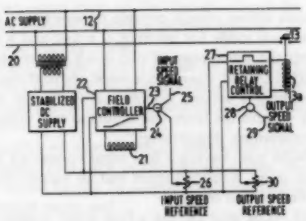
1. A control system for multiple eddy current coupling drives comprising:

an electrical power supply means including first switching means actuable to close, in response to a start signal, a

contact in the circuit of a second switching means, and a timing means arranged to complete the circuit of the second switching means for a predetermined period thus enabling power to be supplied to the several coupling drives, and thereby energising a retaining relay in each coupling drive, said retaining relays having contacts being connected in series in a retaining circuit arranged to retain the said second switching means after said predetermined period has elapsed,

electronic control means integral with, or in close proximity to, each coupling drive and arranged to automatically initiate an increase of excitation applied to each coupling drive from an initial zero value to a preset maximum value over a preset time when power is applied to each coupling





drive, said control means including means for inhibiting the increase in excitation in response to input speed signals, speed sensing means for monitoring the input and output speeds of the coupling drive, said input speed being compared with a predetermined level, said increase in excitation being inhibited when said input speed falls to the predetermined level, and

means for de-energising at least one retaining relay in response to timing means initiated by an inhibiting signal such that said at least one relay is de-energised after a preset time unless an output speed signal indicates that a conveyor is beginning to accelerate, thus interrupting said retaining circuit and interrupting power supply to all couplings.

4,477,735

FAST MOS DRIVER STAGE FOR DIGITAL SIGNALS

Wolfgang Gollinger, Gundelfingen, Fed. Rep. of Germany, and Daniel Mlynek, Wolfgantzen, France, assignors to ITT Industries, Inc., New York, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,749

Claims priority, application European Pat. Off., Dec. 20, 1980, 80108079.7; Sep. 8, 1981, 81107047.3

Int. Cl.³ H03K *3/01, 17/693, 17/04*

U.S. Cl. 307—270 **19 Claims**

1. A fast, monolithic integrated driver circuit for digital signals employing insulated-gate field-effect transistors, said driver circuit being connected between a relatively large load capacitance and the output of a preceding stage which can only be loaded by a comparatively small input capacitance of said drive circuit, said drive circuit comprises:

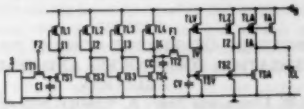
an output inverter including a first load transistor connected in series with a first switching transistor connected in parallel to said load capacitance;

a pre-inverter including a second load transistor connected in series with a second switching transistor; said second switching transistor having its gate electrode coupled to the gate electrode of said first switching transistor;

an enhancement transistor having its source-drain path connected in parallel to the drain-source path of said first load transistor;

said enhancement transistor and said first and second load transistors each having its gate electrode coupled to each other and to the output of said pre-inverter;

said output inverter and said pre-inverter providing a first part of a total capacitance ratio of said load capacitance to said input capacitance and the remaining part of said total



capacitance ratio being provided by a plurality of prestage inverters connected in series relative to signal flow between said gate electrode of said second switching transistor and said preceding stage, each of said plurality of prestage inverters comprising a load transistor connected in series with a switching transistor and being dimensioned to provide the shortest delay time by keeping the quotient of the input capacitance of the next following one of said plurality or prestage inverters in said series and said width-length ratio of the switching transistor the next following one of said plurality of prestage inverters constant, said channel width of each of said plurality of prestage inverters increasing at least partially from stage to stage in the direction of signal flow according to a second geometrical progression.

4,477,736

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE INCLUDING MEANS FOR REDUCING THE AMOUNT OF POTENTIAL VARIATION ON A REFERENCE VOLTAGE LINE

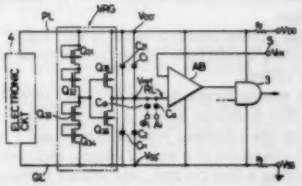
Yoshiaki Onishi, Kokubunji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 26, 1981, Ser. No. 315,056

Claims priority, application Japan, Nov. 7, 1980, 55-155946

Int. Cl.³ H03K *3/013*

U.S. Cl. 307—297 **14 Claims**



1. A semiconductor integrated circuit device comprising:

a pair of first and second wirings to which a power-supply voltage is applied;

an electronic circuit connected between said first wiring and said second wiring, and to which said power-supply voltage is applied via said first and second wirings;

a third wiring to which a reference voltage is applied;

a reference voltage generator to which said power-supply voltage is applied via said first and second wirings, said reference voltage generator including means for producing said reference voltage;

a first capacitor for a-c coupling said third wiring to said second wiring; and

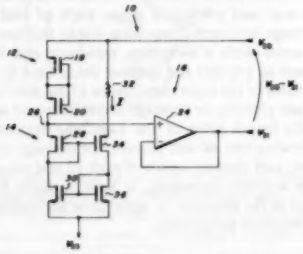
a second capacitor for transmitting variations in potential produced on said first wiring to said third wiring;

wherein when first and second potential variations substantially equal in magnitude and opposite in phase have developed respectively on said first and second wirings due to changes in the operation current of said electronic circuit, the potential variation supplied to said third wiring via said first capacitor is substantially cancelled by the potential variation supplied to said third wiring via said second capacitor.

4,477,737
VOLTAGE GENERATOR CIRCUIT HAVING COMPENSATION FOR PROCESS AND TEMPERATURE VARIATION

Richard W. Ulmer, and Roger A. Whatley, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 14, 1982, Ser. No. 398,033
Int. Cl.³ G05F *1/58*; H03L *1/04*
U.S. Cl. 307—297 **5 Claims**



1. A voltage generator, for providing an output voltage which is reduced a predetermined amount from a supply voltage, to electronic circuitry having devices of a predetermined process type, comprising:

reference voltage means coupled to said supply voltage comprising a diode-connected device of said predetermined process type having electrical characteristics which are matched to corresponding electrical characteristics of said electronic circuitry, for providing a reference voltage;

reference current means coupled to said supply voltage, for providing a reference current proportional to said reference voltage;

current source means having first and second transistors, said first transistor having a first current electrode coupled to the reference voltage means, and a control electrode connected to a second current electrode thereof for providing a first current, said second transistor having a first current electrode coupled to the reference current means, a control electrode connected to the control electrode of the first transistor, and a second current electrode for providing a second current;

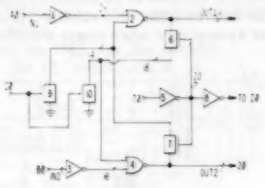
current mirror means coupled between said current source means and a second supply voltage, for making the first current proportional to the second current; and

buffer means having an input coupled to both said reference voltage and the first current electrode of the first transistor, for providing said output voltage which tracks process and temperature variations of the devices of said electronic circuitry.

4,477,738
LSSD COMPATIBLE CLOCK DRIVER

Daniel J. Kouba, Manassas, Va., assignor to IBM Corporation, Armonk, N.Y.

Filed Jun. 14, 1982, Ser. No. 387,990
Int. Cl.³ H03K *5/13*; G01R *31/02*
U.S. Cl. 307—445 **10 Claims**



1. A clock driver circuit capable of selectively assuming a first operational mode for latching at a first and a second circuit outputs the signal state of two clock waveforms at a first and a second circuit inputs in normal applications and alternately assuming a second operational mode for transferring said clock waveforms from said inputs to said outputs, during testing applications, comprising:

a first NOR gate having a first input connected to said first circuit input, a second input and an output connected to said first circuit output;

a second NOR gate having a first input connected to said second circuit input, a second input and an output connected to said second circuit output;

a first switching device connected between said output of said first NOR gate and said second input of said second NOR gate, and having a control terminal connected to a control input, for selectively applying said output of said first NOR to said second input of said second NOR;

a second switching device connected between said output of said second NOR gate and said second input of said first NOR gate, and having a control terminal connected to said control input, for selectively applying said output of said second NOR to said second input of said first NOR;

said first and second switching devices being conductive when said control input is in a first state, causing said first and second NOR gates to be cross-coupled and latch said signal state of said two clock waveforms in said first operational mode, said first and second switching devices being nonconductive when said control input is in a second state;

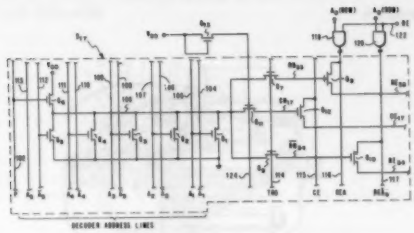
a delay device having an input connected to said control input and an output connected to said second input of said first NOR gate and connected to said second input of said second NOR gate, for conditioning said first NOR gate to transfer said first clock waveform from said first circuit input to said first circuit output and for conditioning said second NOR gate to transfer said second clock waveform from said second circuit input to said second circuit output when said control input is in said second state selectively causing said second operational mode to occur;

whereby said circuit can be selectively adapted to operate in either said normal applications or said testing applications.

4,477,739
MOSFET RANDOM ACCESS MEMORY CHIP

Robert J. Proebsting, Richardson, and Paul R. Schroeder, Dallas, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Continuation of Ser. No. 270,765, Jun. 5, 1981, , which is a continuation of Ser. No. 970,678, Dec. 18, 1978, , which is a division of Ser. No. 644,854, Dec. 29, 1975, Pat. No. 4,156,938.
This application Jul. 27, 1982, Ser. No. 402,395
Int. Cl.³ H03K *19/096, 19/177*
U.S. Cl. 307—449 **5 Claims**



1. An integrated circuit chip including a decode circuit comprising:

at least two input lines to the decode circuit for a corresponding number of binary address signals,

a plurality of decode nodes,

a like plurality of first circuit means for producing a decode signal on a selected one of the decode nodes in response to each combination of binary address signals applied to the input lines,

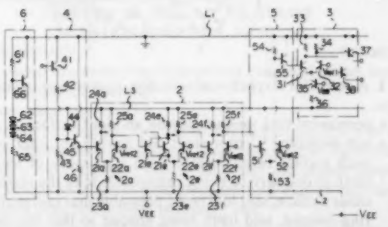
a like plurality of second circuit means for storing the decode signal from each of the decode nodes, each second circuit means having an output isolatable from the respective decode node, and

a like plurality of control circuit means for causing the first and second circuit means to produce a first decode signal on one of the decode nodes in response to a first set of address signals applied to the input lines and to store the decode signal produced therefrom in the respective second circuit means, and then to produce a second decode signal on one of the decode nodes in response to a second set of address signals applied to the input line.

4,477,740
EMITTER-COUPLED LOGIC CIRCUIT DEVICE

Hirofumi Takeda, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 31, 1982, Ser. No. 363,858
Claims priority, application Japan, Mar. 31, 1981, 56-48616
Int. Cl.³ H03K *19/086, 19/092, 19/20*
U.S. Cl. 307—455 **6 Claims**



1. An emitter-coupled logic circuit device having an input terminal operatively connected to an external voltage source, comprising:

first and second voltage supply lines connected, respectively, to ground and the external voltage source;

a voltage regulator, operatively connected between said first and said second voltage supply lines, having an output terminal for providing a regulated potential between ground and the external voltage source;

a third voltage supply line operatively connected to the output terminal of said voltage regulator;

an output buffer circuit operatively connected between said first and said third voltage supply lines;

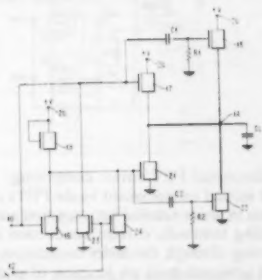
an inner gate circuit operatively connected between said third and said second voltage supply lines; and

input and output level converter circuits connected, respectively, between the input terminal of said emitter-coupled logic circuit device and said inner gate circuit and between said inner gate circuit and said output buffer circuit, the current flowing from said first voltage supply line to said third voltage supply line through said output buffer circuit also flowing from said third voltage supply line to said second voltage supply line through said inner gate circuit.

4,477,741
DYNAMIC OUTPUT IMPEDANCE FOR 3-STATE DRIVERS

John J. Moser, Jr., Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,828
Int. Cl.³ H03K *19/094, 19/003, 19/007*
U.S. Cl. 307—473 **3 Claims**



1. A driver circuit comprising:

an input signal means,

first, second, third, fourth, fifth, sixth and seventh field effect transistors, each having a drain electrode, a source electrode and a control electrode,

the first transistor having its drain electrode coupled to a voltage source through a load device, its source electrode coupled to ground, and its control electrode coupled to said input signal means,

the second transistor having its control electrode coupled to said input signal means, its drain electrode coupled to said voltage source and its source electrode connected to a capacitive load,

the third transistor in parallel with said second transistor, the drain electrode of said third transistor coupled to said voltage source and its source connected to said load, and its control electrode coupled to the control electrode of the second transistor through a capacitor and to ground through a resistor to change the voltage on the control electrode of said third transistor a preselected time after a signal is applied thereto,

the fourth transistor having its control electrode connected to the drain electrode of the first transistor, its drain elec-

trode coupled to the load, and its source connected to ground,

the fifth transistor having its drain electrode connected to the load, its source electrode connected to ground, and its control electrode coupled to the control electrode of the fourth transistor through a capacitor and to ground through a resistor to change the voltage on the control electrode of said fifth transistor a preselected time after a signal is applied thereto,

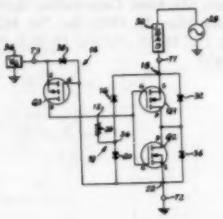
the control electrodes of said sixth and seventh transistors being coupled to a disable input, the drain of the sixth transistor being coupled to the control electrode of said second transistor, and the drain of said seventh transistor being coupled to the control electrode of said fourth transistor and their sources being coupled to ground whereby turning on of said sixth and seventh transistors grounds the control electrodes of said second and fourth transistors thereby isolating said capacitive load.

4,477,742

THREE TERMINAL BIDIRECTIONAL DRAIN TO DRAIN FET CIRCUIT

William J. Janutka, West Allis, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1982, Ser. No. 390,721
Int. Cl.³ H03K *17/16, 17/687*
U.S. Cl. 307—571 **7 Claims**



1. A bidirectional FET circuit comprising:

first and second enhancement mode FETs connected drain to drain in series relation between first and second power switching terminals, current conduction in one direction traversing through the series connection of the forward biased substrate-drain pn junction of said first FET and the drain-source current path of said second FET, and current conduction in the opposite direction traversing through the series connection of the forward biased pn junction of said second FET and the drain-source current path of said first FET;

resistance means connected from a common node connecting the FET gates to each of said power switching terminals, to reference said node to the power switching terminal of greater given polarity; and

current source means connected to said node for driving sid FETs into conduction.

4,477,743

BRAKE-MOTOR

Constantin Apetrei; Victor Nitigus; Elek Demeter; Marian Radulescu, and Toma Sachelarie, all of Bucuresti, Romania, assignors to Institutul De Cercetare Stiintifica Si Inginerie Technologica Pentru Industria Electrotehnica, Bucharest, Romania

Filed Jun. 3, 1982, Ser. No. 387,889
Int. Cl.³ H02K *7/102*
U.S. Cl. 310—77 **4 Claims**

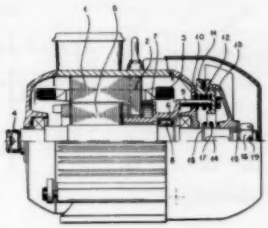
1. An asynchronous electric motor with braking capabilities, comprising:

a motor housing;

a shaft journaled in said housing;

a rotor mounted on said shaft in said housing and comprising a stack of rotor sheets of a given length, and a rotor short-circuiting ring at one end of said rotor stack;

a stator surrounding said rotor and comprising a main stator stack of electrical sheets equal in length to said given length, a supplementary stack of electrical sheets at said end of said stator and extended inwardly to flank said ring, said stacks of said stator being provided with slots receiving an excitation winding and said slots being extended in said supplementary stack inwardly to define teeth;



a brake armature mounted by a bearing on said shaft for axial movement relative to said shaft and prevented from rotation relative to said shaft by said housing, said armature comprising a cylindrical portion reaching axially inwardly of said ring and a further portion juxtaposed with an axially confronting said teeth whereby the energization of said coil generates a magnetic field in said stator stacks and in said ring which acts additively upon said portions to displace said armature; and

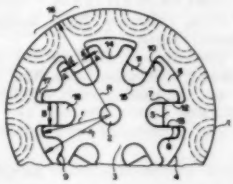
a brake in said housing operatively connected to said armature for deblocking upon the magnetic attraction of said armature.

4,477,744

PERMANENT MAGNET ROTOR WITH GAPS BETWEEN THE MAGNET AND THE HUB

Hermann Gerber, Münchenwiler, Switzerland, assignor to Sodeco-Saia, A.G., Multen, Switzerland

Filed Aug. 29, 1983, Ser. No. 527,300
Claims priority, application Switzerland, Sep. 15, 1982, 5461/82
Int. Cl.³ H02K *21/12*
U.S. Cl. 310—156 **11 Claims**



1. A rotor for a synchronous motor, comprising in combination

a permanent ring magnet having an inner surface,

a hub including a rotor shaft and having an outer surface, each surface being formed with a plurality of teeth, the teeth of one surface being engageable with the teeth of the other surface, said hub being pressable into said permanent ring magnet, said teeth being shaped so that the engaged teeth form a force-locking connection between said ring magnet when said hub is pressed into said ring magnet, but gaps remain between said hub and said ring magnet which

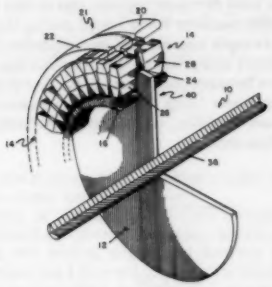
extend along a substantially radial direction, whereby a connection between said hub and said ring magnet is established, while said hub and said ring magnet remain free of being subjected to any tensile stresses along said substantially radial direction.

4,477,745

DISC ROTOR PERMANENT MAGNET GENERATOR

Gregory F. Lux, 218 School St., Woburn, Mass. 01801

Filed Dec. 15, 1983, Ser. No. 561,955
Int. Cl.³ H02K *21/12*
U.S. Cl. 310—156 **4 Claims**



1. An improved permanent magnetic generator comprising:
a rotor disk;
a plurality of magnets mounted adjacent to one another on said rotor disk, said magnets adapted to extend beyond said disk on each side thereof and said magnets being bevelled at the sides of their tops and bottoms to prevent overlap of their magnetic fields;
an inner stator having a first and second side positioned immediately under said magnets on each side of said rotor disk, each side of said inner stator carrying a plurality of coils in which current can be induced by movement of said magnets on said rotor; and
an outer stator positioned immediately above said magnets concentric to and circumferentially around said magnets having a first set of coils above the magnets on one side of said rotor disk and a second set of coils above the magnets on the other side of said rotor disk, said coils adapted so that a current is induced therein upon rotation of said magnets.

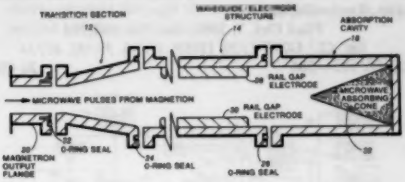
4,477,746

MICROWAVE-TRIGGERED LASER SWITCH

Martin S. Piltch, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 19, 1982, Ser. No. 379,797
Int. Cl.³ H01J *7/46, 19/80*
U.S. Cl. 315—39 **9 Claims**

1. A switch for switching high-power electrical pulses from a power supply comprising:
a microwave waveguide;
a pair of opposing rail electrodes forming an integral part of said microwave waveguide, said pair of rail electrodes biased by said power supply such that said power supply produces an electric field between said pair of rail electrodes near breakdown potential; and
microwave generator means connected to said microwave waveguide for producing microwave pulses past said pair of rail electrodes having sufficient energy to distort said electric field to cause breakdown between said rail electrodes,



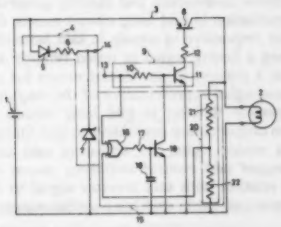
whereby said pair of rail electrodes provide a large conduction area that reduces induction effects of said switch and minimizes electrode erosion.

4,477,747

LAMP CIRCUIT FOR AUTOMOBILE

Kiyoshi Wakai; Toshirou Shimodaira, and Yoneharu Fukushima, all of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Sep. 27, 1982, Ser. No. 423,780
Claims priority, application Japan, Oct. 3, 1981, 56-157957
Int. Cl.³ H05B *37/00*
U.S. Cl. 315—200 A **10 Claims**

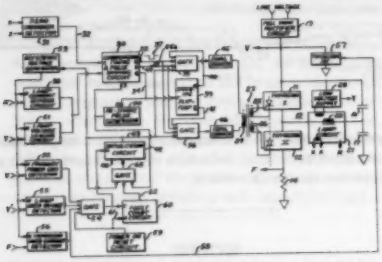


1. A lamp circuit comprising:
(a) a lamp,
(b) a source of power,
(c) a first transistor connected in series with said lamp and source of power for providing current to said lamp when said transistor is in the conducting state,
(d) intermittent on-off control means responsive to an on-off input signal and connected to an input electrode of said first transistor for intermittenly turning on and off said first transistor, and
(e) short circuit detector means for turning off said first transistor when a short circuit occurs in said lamp, said short circuit detector means comprising:
(i) voltage detection means connected in parallel across said lamp for detecting voltage variations in said lamp,
(ii) switch means connected to said intermittent on-off control means for forcing said latter means to an off condition, thereby forcing off said first transistor, when said switch means is activated,
(iii) switch control means for controlling said switch means so as not to activate said switch means for a predetermined period of time after said first transistor is turned on, connected to said switch means, said voltage detection means, and said intermittent on-off control means, for providing a control signal under the condition that said on-off input signal is on and said voltage detection means detects a lamp voltage below a predetermined minimum.

4,477,748
SOLID STATE BALLAST

Calvin E. Grubbs, Garland, Tex., assignor to Thomas Industries, Inc., Louisville, Ky.

Filed Oct. 7, 1980, Ser. No. 194,783
Int. Cl.³ G05F *1/00*; H05B *37/00, 39/00, 41/14*
U.S. Cl. 315—306 **26 Claims**

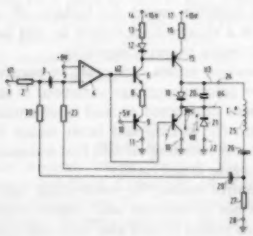


1. An inverter circuit receiving power from a power source and generating a high frequency inverter signal for energizing gaseous discharge lamp circuit means comprising: control switching means connected in circuit with said power source and said lamp circuit means; reactive circuit means connected in circuit with said switching circuit means and said lamp circuit means for causing current flowing therein to oscillate at high frequency; driver circuit means for triggering said control switching means to conduct and thereby generate said high frequency oscillation in said lamp circuit means; first detector circuit means responsive to signals in said lamp circuit means for generating a timing signal in timed relation with said inverter signal; a current sensor circuit means for generating a current sensor signal representative of the magnitude of high frequency current flowing in said lamp circuit means; and commutation circuit means responsive to said timing signal and said current sensor signal for actuating said driver circuit means to trigger said control switching means in predetermined time relation with said inverter signal to regulate the high frequency current in said lamp circuit means.

4,477,749
CIRCUIT FOR GENERATING A SAWTOOTH CURRENT IN A COIL

Peter C. Schmale, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,231
Claims priority, application Netherlands, Mar. 25, 1982, 8201237
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—397 **2 Claims**

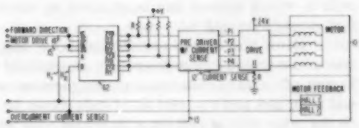


1. A circuit for generating a sawtooth current in a coil, the circuit having a first terminal or receiving a sawtooth voltage and a second terminal coupled to the coil for supplyng the sawtooth current, a supply voltage terminal, an amplifier circuit including an amplifier circuit connected between said first and second terminals for converting the applied voltage into the current to be supplied during trace periods of the sawtooth current, the amplifier circuit comprising during retrace periods of the sawtooth current a resonant circuit coupled to the second terminal and including at least said coil, a capacitor, first and second diodes and a transistor, the second terminal being connected via a parallel arrangement of the capacitor and the second diode to one electrode of the first diode and one electrode of said transistor, respectfully, a further electrode of each of said first diode and transistor being connected to said supply voltage terminal, the junction of the capacitor, the first and second diodes, and the transistor being connected to the supply voltage terminal via said transistor said first and second diodes having the same forward direction, said transistor being connected with a forward direction opposite that of said first and second diodes, said transistor being biased during the retrace periods of the sawtooth current; the improvements wherein said amplifier circuit comprises an amplifier having a signal input, the junction between the capacitor, the first and second diodes and the transistor being fed-back via a resistor to said signal input of said amplifier, said signal input further being coupled to said first-terminal.

4,477,750
MULTI-LEVEL DISK DRIVE MOTOR SPEED CONTROL

David W. Collins; John J. Neesz, and Michael C. Stich, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 17, 1982, Ser. No. 378,968
Int. Cl.³ H02P *1/22*
U.S. Cl. 318—270 **6 Claims**



1. In an information storage device including a rotating information carrying media, a motor for driving the rotating media and a processor unit, a motor drive control for regulating the rotational speed of the rotating media comprising:

first means for accelerating said information carrying media to an operating speed and effecting rotational speed regulation within a predetermined range under control of said processor unit;

digital circuit means for maintaining said information carrying media speed within a predetermined range of rotational velocities, whereby said processor unit is freed to handle non-motor related matters during no error operation; and

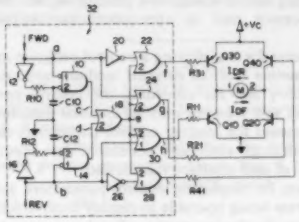
sensing means for transferring motor drive control to said first means when an error condition occurs with respect to speed regulation effected by said digital circuit means.

4,477,751

MOTOR BRAKE DEVICE

Katsumi Kanayama, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1981, Ser. No. 257,863
Claims priority, application Japan, May 1, 1980, 55-58401
Int. Cl.[3] H02P 1/22
U.S. Cl. 318—280 6 Claims



1. A motor device for controlling a motor having two terminals, the motor device comprising:

a source of forward and reverse instruction signals, said forward and reverse instruction signals each having leading and trailing edges; said forward instruction signal designating a forward rotation of a motor and said reverse instruction signal designating a reverse rotation of said motor;

signal means responsive to a forward instruction signal and to a reverse instruction signal, for providing a trailing signal which is generated for a given period of time following the trailing edge of said forward instruction signal and the trailing edge of said reverse instruction signal;

first gate means coupled to said signal means and being responsive to said forward instruction signal and to said trailing signal, for providing a first signal which corresponds to the logical OR of said trailing signal and a signal having an inverted level of said forward instruction signal;

second gate means coupled to said signal means and being responsive to said forward instruction signal and to said trailing signal, for providing a second signal which corresponds to the logical OR of said trailing signal and said forward instruction signal;

third gate means coupled to said signal means and being responsive to said reverse instruction signal and to said trailing signal, for providing a third signal which corresponds to the logical OR of said trailing signal and a signal having an inverted level of said reverse instruction signal;

fourth gate means coupled to said signal means and being responsive to said reverse instruction signal and to said trailing signal, for providing a fourth signal which corresponds to the logical OR of said trailing signal and said reverse instruction signal;

a first transistor having an emitter-collector path which is coupled between a first power supply potential and a first terminal of said motor, and a base which receives said first signal;

a second transistor having an emitter-collector path which is coupled between a second power supply potential and a second terminal of said motor, and a base which receives said second signal;

a third transistor having an emitter-collector path which is coupled between said first power supply potential and the second terminal of said motor, and a base which receives said third signal; and

a fourth transistor having an emitter-collector path which is coupled between said second power supply potential and the first terminal of said motor, and a base which receives said fourth signal;

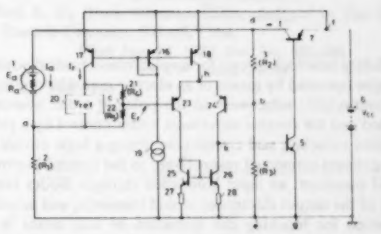
said second signal having the same logic level as said fourth signal during said given period of time, so that said second and fourth transistors are simultaneously turned on, the first and second terminals of said motor thereby being short-circuited through the emitter-collector path of said second and fourth transistors.

4,477,752

SPEED CONTROL APPARATUS FOR DC MOTOR

Hiromitsu Nakano, Katano, and Isao Yoshida, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 1, 1982, Ser. No. 353,420
Claims priority, application Japan, Mar. 18, 1981, 56-39995
Int. Cl.[3] G05B 5/00
U.S. Cl. 318—331 6 Claims



1. A speed control apparatus for a DC motor comprising:

a bridge circuit to be completed by including as one arm, a first series circuit comprising a first resistance and said DC motor, the counter electromotive force of which is proportional to the revolutional speed of said DC motor, and as the other arm, a second series circuit comprising a second resistance and a third resistance,

detection terminals comprising a first connection point of said DC motor and said first resistance, and a second connection point of said second resistance and said third resistance, for producing a voltage proportional to the counter electromotive force of said DC motor,

a differential amplifier for amplifying signal of difference between a reference voltage and said produced voltage of said detection terminals,

a current control means for controlling a current supplied to said bridge circuit by controlling a current control transistor inserted between a feeding terminal of said bridge circuit and a positive end of a power source, utilizing an output of said differential amplifier,

a first transistor being connected by its emitter to said positive end of said power source and by its collector to a constant current circuit,

a second transistor being connected by its emitter to said positive end of said power source and by its collector to a constant voltage circuit which produces said reference voltage,

a third transistor being connected by its emitter to said positive end of said power source and by its collector to said differential amplifier, and

said second and third transistors constituting current mirror transistors with respect to said first transistor.

4,477,753
SAFETY INTERLOCK FOR AN ELECTRIC POSITIONING SYSTEM

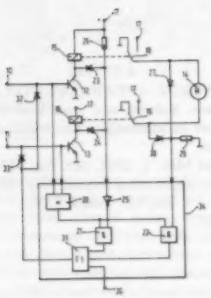
Rüdiger Ratzel, Bühl, and Erich Schneider, Kirchheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,351

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135888

Int. Cl.³ G05B *9/02*

U.S. Cl. 318—563 **6 Claims**



1. Safety interlock circuit for an electromechanical positioning drive operated by means of an electric motor having terminals connectable selectively to the poles of a d.c. source for forward and for reverse movement under control by a pair of transistor switches, said circuit comprising a logic circuit (34) having inputs connected respectively to the control electrodes of said transistor, an input connected through diodes respectively to the output electrodes of said transistor, and an output connected for blocking the operation of said motor in the absence of a control signal at the control electrodes of either of said transistors if at the same time the output of at least one of said transistors is substantially inconsistent with the absence of control signals.

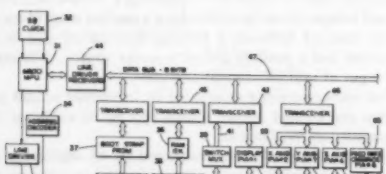
4,477,754
INTERACTIVE MACHINING SYSTEM

Gerald V. Roch, Indianapolis, Ind.; James P. Wiles, Olean, N.Y., and Chris L. Hadley, Indianapolis, Ind., assignors to Hurco Mfg. Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 151,909, May 21, 1980, abandoned, which is a continuation of Ser. No. 702,569, Jul. 6, 1976, abandoned. This application Sep. 25, 1981, Ser. No. 305,511

Int. Cl.³ G05B *19/42*

U.S. Cl. 318—568 **19 Claims**



1. A programmable microcomputer control apparatus for controlling the relative motion between a tool and a workpiece comprising:

indicator means for providing at an output digital signals indicative of the relative position between the tool and the workpiece;

an alterable memory operable to retain a control program and control parameters;

a microprocessor unit coupled to the output of the indicator means and to the memory and operable to produce control signals dependent upon said indicator means output and said control parameters according to said control program;

control means for directing said control signals from the microprocessor unit to appropriate motion-providing means;

interface means for transferring a control program and control parameters from an external medium into said alterable memory and for recording the control parameter contents of said memory onto an external medium;

data entry means for loading control parameters into said memory through externally accessible data inputs independently of said interface means; and

display means for displaying control parameters, said control program being operable to display control parameter inquiries on the display means, whereby an operator may load control parameters into said memory through said data entry means in response to the inquiries, said apparatus including means to sequentially display data block inquiries and to display, in response to the loading of certain contol parameters into said memory relating to the data block inquiries, separate displays of additionl control parameter inquiries relating to information used in the data block which was the subject of the previous inquiry, whereby the sequential display of inquiries and direct loading of control parameters as to an operation can be used to make the use of the device simpler and more responsive to the operator.

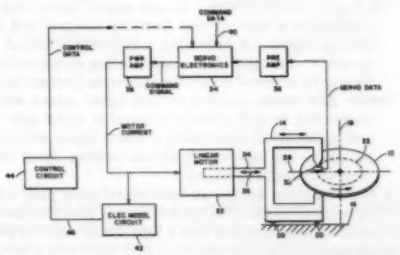
4,477,755
METHOD OF SUPPRESSING SEEK-EXCITED VIBRATION IN A DISK DRIVE OR SIMILAR SERVO SYSTEM

David W. Rickert, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Jun. 28, 1982, Ser. No. 392,488

Int. Cl.³ G05B *5/01, 23/02*

U.S. Cl. 318—611 **9 Claims**



1. A disk drive control circuit for use with a disk drive that includes a rotatable disk and means for writing or reading information to or from selected locations of said disk, said write or read means including a mechanical system that selectively positions a head assembly so as to provide access to selected locations of said disk, said disk drive control circuit comprising:

an electrical circuit that comprises a model of said mechanical system;

means for exciting said electrical model circuit with a drive signal representative of the mechanical forces applied to said mechanical system in order to selectively position said head assembly, said electrical model circuit being adapted to provide a response signal that is representative

of the displacement of said head assembly within said mechanical system;

alarm means for monitoring said response signal and generating an alarm signal whenever said response signal exceeds a predetermined threshold; and

control means responsive to said alarm signal for preventing the movement of said head assembly for a period of time;

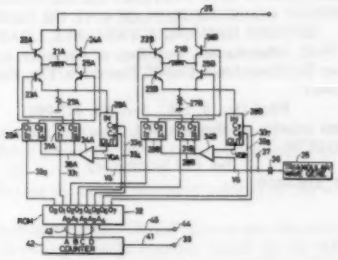
whereby undesirable mechanical resonances associated with a particular sequence of head assembly positioning cycles can be stopped by selectively delaying the movement of said head assembly.

4,477,756

STEPPING MOTOR EXCITING SYSTEM

Fujio Moriguchi, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Kanagawa, Japan

Filed Dec. 3, 1982, Ser. No. 446,306
Claims priority, application Japan, Dec. 4, 1981, 56-194441
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **10 Claims**



1. A stepping motor excitation system for effecting one or two-phase excitation of excitation coils of a motor in either a stepwise mode or a linear mode, said system comprising:

means for causing excitation currents flowing through said excitation coils of a stepping motor to have four stepwise fixed values respectively;

current value setting means for setting said means for causing excitation currents flowing through each of said excitation coils to one of four stepwise fixed values;

memory means provided with first and second storage areas, wherein said first storage area stores information for controlling the current flowing through each of said excitation coils when said motor is to be run in the stepwise mode, and wherein said second storage area stores information for controlling the current flowing through each of said excitation coils when said motor is to be run in a linear mode; and

selecting means for selecting one of said storage areas of said memory means in accordance with a desired mode of operation of said motor.

4,477,757

PHASE COMMUTATOR FOR CLOSED LOOP CONTROL OF A STEPPING MOTOR

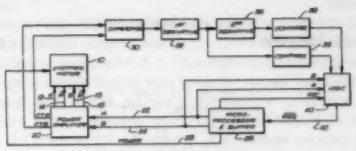
Gaston A. Palombo, Agoura, and Dung D. Do, Burbank, both of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed Feb. 21, 1983, Ser. No. 477,132
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **21 Claims**

1. A commutation circuit for a stepping motor comprising:

first sensor means for providing first position signals indicating that the motor is in a position where commutation would result in maximum accelerating torque;

second sensor means for providing second position signals indicating that the motor is in a position where commutation would result in minimum braking torque; and



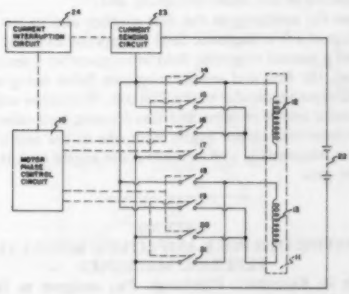
control means for generating commutation signals to the motor during acceleration in response to the first position signals and during deceleration in response to the second position signals.

4,477,758

STEPPING MOTOR OVERCURRENT DETECTION AND PROTECTION DEVICE

Mark S. De Biasi, Windsor, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Jun. 10, 1983, Ser. No. 503,246
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **4 Claims**



1. An overcurrent detection and protection device for a stepping motor drive system, the system having means for controlling the current flow thereto, comprising:

(a) a first resistor through which the current flow passes and across which a voltage drop proportional to the current flow is developed;

(b) a photon coupled isolator connected in parallel with the first resistor and having an output signal, which output signal changes level when the voltage drop across the first resistor reaches a predetermined level;

(c) a signal means responsive to the detecting means for producing a signal to the current controlling means upon an overcurrent condition, causing the current controlling means to terminate the overcurrent condition;

(d) delay means for maintaining the signal to the current controlling means for a predetermined length of time and subsequently resetting the device to its state existing prior to the overcurrent condition; and

(e) a second resistor connected in series with the isolator, which second resistor is adjustable to vary the response level of the isolator to the voltage drop across the first resistor.

4,477,759
STEPPING MOTOR UNIT

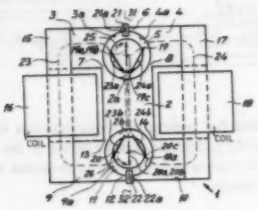
Yves Guérin, Granges, and Pierre-André Meister, Bienne, both of Switzerland, assignors to ETA S.A., Fabriques d'Ebauches, Granges, Switzerland

Filed Apr. 20, 1983, Ser. No. 486,641

Claims priority, application Switzerland, Apr. 21, 1982, 2411/82

Int. Cl.³ H02K *29/04*

U.S. Cl. 318—696 **15 Claims**



1. A motor unit comprising:

a first rotor having a first axis of rotation and including a first permanent magnet having a first magnetic axis substantially perpendicular to the first axis of rotation;

a second rotor having a second axis of rotation and including a second permanent magnet having a second magnetic axis substantially perpendicular to the second axis of rotation;

means for orienting the first and second magnetic axes along a first rest axis and a second rest axis respectively, in the absence of any other influence; and

means for applying to the first magnet and to the second magnet a first magnetic field in response to a first current and a second magnetic field in response to a second current, the first and second magnetic fields being substantially perpendicular to the first axis of rotation and to the second axis of rotation and also forming two substantially symmetrical obtuse angles with one of the rest axes and two substantially symmetrical acute angles with the other rest axis.

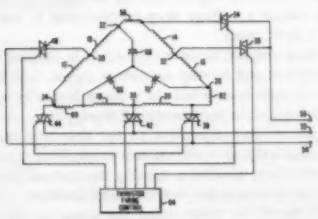
4,477,760
CONTINUOUS POLE AMPLITUDE MODULATED ELECTRIC MACHINES

Stephen B. Kuznetsov, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 24, 1983, Ser. No. 478,431

Int. Cl.³ H02P *7/48*

U.S. Cl. 318—773 **9 Claims**



1. An electric machine comprising:

first and second sets of terminals for connection to an external AC power source;

a stator winding electrically alternatively connected to said first and second sets of terminals, and wound to form a first number of poles between said first set of terminals and a second number of poles between said second set of terminals;

a plurality of switches for switching said external power source alternatively between said first and second sets of terminals; and

means for controlling said switches wherein the time during which said external power source is successively connected between said first and second sets of terminals is greater than the period of said external AC power source and less than the combined magnetization-rotor loop time constant of the machine, wherein the frequency of the external AC power source remains constant.

4,477,761
METHOD OF AND SYSTEM FOR MINIMIZING CURRENT CONSUMPTION OF ONE OR MORE A-C MOTORS DRIVING A VARIABLE LOAD

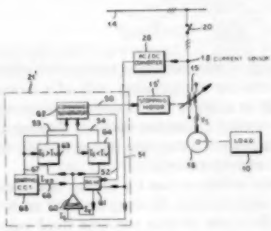
Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

Filed Dec. 8, 1982, Ser. No. 447,998

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148794

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—800 **24 Claims**



1. A method of minimizing current consumption of an electric motor having a stator connected across a supply circuit and a rotor entrained by a rotating electromagnetic field generated in response to an alternating input voltage in said stator, said rotor being connected to a variable load,

comprising the steps of:

(a) modifying the RMS value of said input voltage by algebraically summing therewith a voltage increment of a given sign;

(b) detecting a resulting current change in said supply circuit and determining the direction of the detected change;

(c) upon detecting an increased current in step (b), modifying the RMS value of said input voltage by algebraically summing therewith a voltage increment of a sign opposite that of step (a);

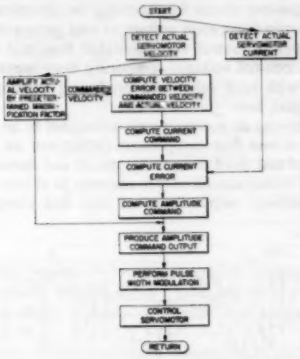
(d) upon detecting a decreased current due to a voltage modification according to one of steps (a) and (c), continuing the modification of said RMS value by algebraic summation therewith of at lease one further voltage increment of the sign yielding the decreased current until the magnitude of the current diminishing in response thereto has substantially leveled off; and

(e) repeating from time to time a sequence of operations including at least steps (a), (b) and (d).

4,477,762
SERVOMOTOR CONTROL METHOD AND APPARATUS THEREFOR

Mitsuo Kurakake, Hino, and Keiji Sakamoto, Hachioji, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 23, 1983, Ser. No. 535,341
Claims priority, application Japan, Sep. 24, 1982, 57-166367
Int. Cl.³ H02P 5/40
U.S. Cl. 318—802 6 Claims



1. A servomotor control method for a system having a current drive circuit for driving the servomotor, comprising the steps of:

(a) detecting the actual rotational velocity of the servomotor;

(b) detecting the actual current flowing into the servomotor;

(c) determining a velocity error based on the difference between a commanded velocity and the actual rotational velocity;

(d) generating a current command based on the velocity error;

(e) determining a current error based on the difference between the current command and the actual current;

(f) amplifying the actual rotational velocity by a predetermined multiplying factor to produce a velocity compensation signal;

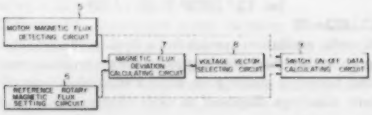
(g) combining the current error and the velocity compensation signal to generate a compensated amplitude command signal; and

(h) controlling the operation of the current drive circuit based on the compensated amplitude command signal.

4,477,763
METHOD OF CONTROLLING INVERTER AND SYSTEM THEREFOR

Katsuhiro Asano, Toyoake, and Yuzuru Tsunehiro, Kasugai, both of Japan, assignors to Kabushi Kaisha Toyota Chuo Kenkyusho, Japan

Filed Jul. 28, 1983, Ser. No. 518,147
Claims priority, application Japan, Aug. 2, 1982, 57-135023
Int. Cl.³ H02P 7/42
U.S. Cl. 318—811 20 Claims


MOTOR MAGNETIC FLUX DETECTING CIRCUIT
MAGNETIC FLUX DEVIATION CALCULATING CIRCUIT
VOLTAGE VECTOR SELECTING CIRCUIT
SWITCH ON-SET DATA CALCULATING CIRCUIT
REFERENCE ROTARY MAGNETIC FLUX SETTING CIRCUIT

1. A method of controlling an inverter having a plurality of switches comprising the steps of:

determining a desired magnetic flux as a reference rotary magnetic flux for an AC motor to be controlled;

detecting an actual magnetic flux of said AC motor;

detecting a deviation between said actual magnetic flux of said AC motor and said reference rotary magnetic flux;

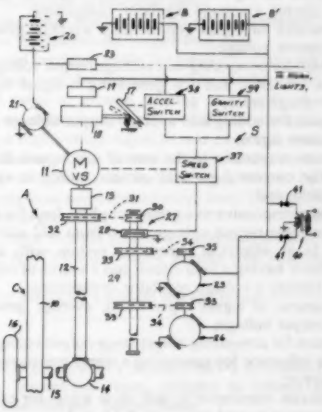
comparing said deviation with reference values corresponding to a permissible region of said deviation on a vector plane;

selecting a voltage vector from among the voltage vectors of said AC motor determined by the ON-OFF pattern of said switches in said inverter, to maintain said deviation within said permissible region and hold the actual magnetic flux of said AC motor within a permissible tolerance with respect to said desired magnetic flux to smoothly rotate said AC motor, the number of said voltage vectors being defined by 2N, where N is equal to the number of said switches.

4,477,764
ENERGY GENERATING AND STORAGE SYSTEM FOR ELECTRIC VEHICLE OR THE LIKE

Earsel W. Pollard, 9943 Coddington Way, St. Louis, Mo. 63132

Filed Jul. 15, 1982, Ser. No. 398,759
Int. Cl.³ H02J 7/00
U.S. Cl. 320—62 14 Claims



14. In an electric vehicle of the type having principal electric storage battery means as a primary source of direct current voltage, a variable speed direct current motor and main drive train driven thereby, and a movable accelerator pedal and accelerator-responsive controls for varying the amplitude of electric power to operate said motor at said variable speeds and power level demands of said vehicle and secondary battery means and current generating means therefor connected to the main power train for operating electric accessories of said vehicle; the improvement comprising an energy recovery and storage system comprising primary electric current generating means adapted for charging said principal battery means, coupling means including an auxiliary power train and electric clutch means adapted to be engaged and disengaged from a driving connection between said main and auxiliary power trains for predetermined operation of said primary generating means, said secondary battery means providing the main power source for said electric clutch means, and multiple switch means responsive to preselected vehicle operating conditions for completing the circuit between said secondary battery means and said electric clutch for shifting said primary generating means between an engaged and power generating condition and a disengaged inoperative condition.

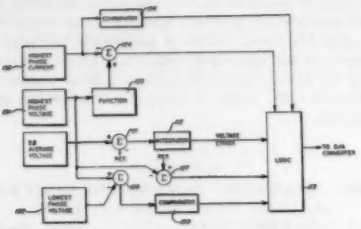
4,477,765
VOLTAGE REGULATOR

Timothy F. Glennon; William J. Peterson, both of Rockford, and James B. Thom, Freeport, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 189,776, Sep. 22, 1980, Pat. No. 4,403,292, and a continuation of Ser. No. 43,804, May 30, 1979, abandoned. This application Sep. 1, 1983, Ser. No. 528,729

Int. Cl.³ H02P *9/00, 9/30*

U.S. Cl. 322—20 **5 Claims**



1. In an electrical generating system with a multi-phase generator having a field circuit and a source of current for said field circuit, a voltage regulator, comprising:

a source of signal representing average generator phase output voltage;

means for comparing said average output voltage signal with a reference and for generating a signal representing a voltage error;

means for adding said average output voltage signal to said error signal;

means responsive to the sum of said signals for controlling the current from said current source to said generator field; and

means responsive to a generator phase fault for blocking said average output voltage signal from said adding means.

4. In an electrical generating system with a multi-phase generator having a field circuit and a source of current for said field circuit, a voltage regulator, comprising:

a source of signal representing average generator phase output voltage;

means for comparing said average output voltage signal with a reference for generating a signal representing a voltage error;

a circuit responsive to said error signal for controlling the current to said generator field; and

means responsive to an excessive phase voltage difference for reducing the gain of the circuit of the voltage error signal.

4,477,766
APPARATUS FOR CONTROLLING ELECTRIC GENERATION FOR VEHICLES

Yoshio Akita, Chiryu; Takanori Teshima, Kariya; Koshi Torii, Iwakura, and Toshinori Maruyama, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 24, 1982, Ser. No. 352,063

Claims priority, application Japan, Feb. 26, 1981, 56-27509

Int. Cl.³ H02J *7/14, 7/24*

U.S. Cl. 322—28 **5 Claims**

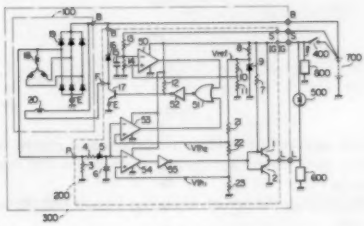
1. An apparatus for controlling electric generation for vehicles for use in an electric generating apparatus for a vehicle having a battery comprising a generator and an electric generation display device, said electric generation control apparatus comprising:

a first comparator circuit for receiving a detection value of a voltage of said battery and a first referenence control voltage, comparing both input signal voltages with each other and producing a comparison output signal;

an electric generation display control circuit comprising a second comparator circuit for receiving a detection value of an electric generation voltage of said generator and a second reference control voltage, comparing both input signal voltages with each other and producing a comparison output signal, and a driver circuit having an input terminal connected to an output terminal of said second comparator circuit and an output terminal connected to said electric generation display device for driving said electric generation display device in response to the comparison output signal from said second comparator circuit;

a third comparator circuit for receiving the detection value of the electric generation voltage of said generator and a third reference control voltage higher than said second reference control voltage, comparing both input signal voltages with each other and producing a comparison output signal; and

means for driving an exciter circuit connected to an output terminal of said first comparator circuit and an output terminal of said third comparator circuit and operating to drive said exciter circuit only in response to at least one of the comparison output signal of said first comparator



circuit produced when the detection value of the battery voltage is lower than the first reference control voltage and the comparison output signal of said third comparator circuit produced when the detection value of the electric generation voltage of said generator is lower than the third reference control voltage;

whereby the detection value of the electric generation voltage of said generator is maintained at the third reference control voltage and above, thereby prohibiting the operation of said driver circuit of said electric generation display control circuit during a continuing electric generating operation of said generator, and

wherein the output terminal of said driver circuit of said electric generation display control circuit is connected to a junction point of said electric generation display device and an electric load on said vehicle which are connected in series between a supply source of the battery voltage and ground, and said driver circuit alternately energizes and de-energizes said electric generation display device and said electric load on said vehicle respectively at the same time.

4,477,767
STATIC EXCITATION SYSTEM

George M. Cotzas, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 1, 1980, Ser. No. 211,766

Int. Cl.³ H02P *9/30, 11/00*

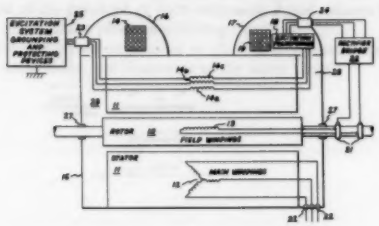
U.S. Cl. 322—59 **9 Claims**

1. A static excitation system for a dynamoelectric machine having a rotating field winding producing a rotating magnetic field and having a stator core with a multiphase set of main armature windings disposed in slots therein, said excitation system comprising:

a set of multiphase excitation windings in the form of at least one electrically conductive bar disposed in at least one slot in said stator core corresponding to said multiphase set of

main windings and disposed correspondingly in said slots so that there is one excitation winding for each main winding;

an internal multiphase excitation transformer consisting essentially of multiphase primary and secondary windings in correspondence with said multiphase excitation windings, each primary winding being electrically connected to a corresponding excitation winding, said primary and said secondary windings of said excitation transformer



being inductively loosely coupled providing leakage reactance for limiting rapid transient current flow from said electrically conductive bars of said excitation winding; and

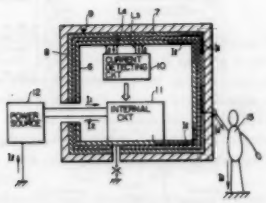
rectifier means electrically connected to receive electrical power from said secondary windings in proportion to voltage induced in said excitation windings by said rotating magnetic field and to provide direct current excitation for said rotating field winding.

4,477,768

LEAKAGE CURRENT DETECTING STRUCTURE

Junichi Hiramoto; Shinya Takenaka, and Katsuyoshi Sunago, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 19, 1982, Ser. No. 350,486
Claims priority, application Japan, Feb. 23, 1981, 56-25094
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—51 **9 Claims**



1. A leakage current detecting structure comprising:

an electrically conductive inner housing which covers an internal circuit;

an electrically conductive outer housing provided on an insulating layer formed onthe outer surface of said inner housing in a manner such that said outer housing covers the outer surface of said inner housing through said insulating layer; and

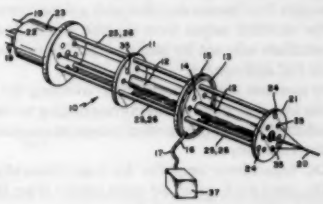
a current detecting circuit included within said inner housing through which said outer and inner housings are electrically connected to each other, for detecting current flowing between said inner and outer housings.

4,477,769

CABLE PLEXER FAULT LOCATOR

James O. Lowery, Ranburne, Ala.; O. Leon Thomas, Carrollton, Ga.; Nathan I. Baston, Bremen, Ga.; Darrell L. Smith, Carrollton, Ga.; Walter K. Jiles, Whitesburg, Ga., and R. Emory Starnes, Jr., Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Mar. 29, 1982, Ser. No. 362,726
Int. Cl.³ G01R *31/12*
U.S. Cl. 324—54 **26 Claims**



13. The method of identifying cable insulation faults while plexing multiplex cable comprising the steps of:

(a) supplying lengths of insulated cable;

(b) advancing each insulated cable along a straight path parallel to predetermined longitudinal axis;

(c) testing said insulated cable for insulation faults while in said straight path by connecting the conductor of said insulated cable to ground, passing said insulated cable through an electrode concentric with said straight path, applying a high voltage signal to said electrode, establishing an electro motive force within said electrode, and detecting changes in said electrical signal caused by flow of electrons from said electro motive force through insulation faults to ground;

(d) rotating each straight path about said longitudinal axis;

(e) plexing each insulated cable around said longitudinal axis; and

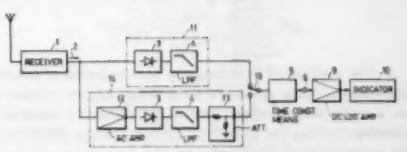
(f) collecting multiplex cable on storage means.

4,477,770

NOISE FIELD INTENSITY MEASURING APPARATUS

Shigeki Tojo, Musashino, Japan, assignor to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Mar. 17, 1982, Ser. No. 359,137
Claims priority, application Japan, Mar. 20, 1981, 56-39780[U]
Int. Cl.³ G01R *27/00*
U.S. Cl. 324—57 N **13 Claims**



1. A noise field intensity measuring apparatus adapted for enlarging the measuring dynamic range, comprising

a receiver capable of changing its receiving frequency;

at least first and second signal paths respectively having the input sides thereof connected to the output side of the receiver;

changeover switching means connected to the output sides of said signal paths, for selectively taking out output signals thereof;

a first rectifier inserted in series in the first signal path, for rectifying the output from the receiver;

an AC amplifier inserted in series in the second signal path, for amplifying with a gain value G the output from the receiver;

a second rectifier inserted in series in the second signal path at the output side of the AC amplifier, for rectifying the amplified output from the AC amplifier;

an attenuator inserted in the second signal path at the stage following the second rectifier, for attenuating with an attenuation value equal to said gain value G a signal corresponding to the rectified output from the second rectifier;

low-pass filter means supplied with a signal corresponding to the rectified output from the one of said first and second rectifiers selected by said changeover means, to take out its DC component;

time constant circuit means for converting the output from the low-pass filter means corresponding to the signal path selected by said changeover means into a quasi-peak value detected output;

a DC logarithmic amplifier for logarithmically amplifying the quasi-peak value detected output from the time constant circuit means; and

an indicator supplied with the output from the AC logarithmic amplifier to display its magnitude

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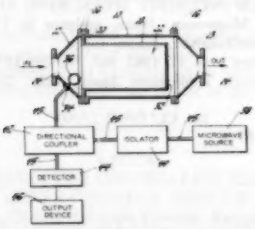
4,477,771

MICROWAVE DETECTION OF SOOT CONTENT IN A PARTICULATE TRAP

Louis L. Nagy, Warren; David S. Eddy, Romeo, and Michael J. O'Rourke, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 21, 1982, Ser. No. 390,406
Int. Cl.³ G01R *27/04*
U.S. Cl. 324—58.5 C **3 Claims**



1. The method of detecting the accumulation of conductive particulates being collected from diesel engine exhaust gases on a collection medium formed of dielectric material in a chamber having the property of a microwave resonance cavity, comprising the steps of:

collecting particulates on the medium in a pattern substantially uniformly dispersed throughout the cavity whereby the dielectric loading of the cavity increases with increasing conductive particulate content,

exciting the cavity with microwave energy, and

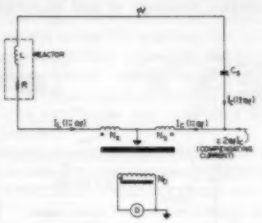
monitoring the response of the cavity to the microwave energy to sense the effective dielectric constant of the material within the cavity thereby providing a measure of the conductive particulate content in the collection medium.

4,477,772

FREQUENCY COMPENSATOR FOR A CURRENT-COMPARATOR CAPACITANCE BRIDGE

Eddy So, Ottawa, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Mar. 29, 1982, Ser. No. 363,143
Int. Cl.³ G01R *11/52, 27/26*
U.S. Cl. 324—59 **8 Claims**



1. In a current comparator capacitance bridge for measuring inductance wherein the bridge includes first comparator winding connected to a reference capacitor and second comparator winding for connection to the inductance, a method for rendering the bridge insensitive to frequency fluctuations comprising:

deriving a compensating current proportional to twice the change in current through the reference capacitor due to the frequency fluctuations; and

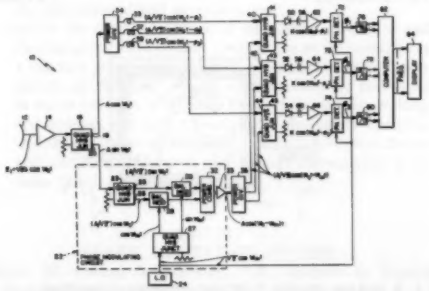
driving the compensating current through the first comparator windings to produce a current in the first winding having frequency characteristics similar to those of the current in the second comparator winding.

4,477,773

FREQUENCY MEASURING APPARATUS

Donald L. Margerum, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 2, 1982, Ser. No. 404,113
Int. Cl.³ G01R *23/14*
U.S. Cl. 324—79 R **4 Claims**



1. Apparatus for measuring the frequency of an input signal having a frequency, f, comprising:

(a) means for feeding the input signal to a pair of separate signal channels;

(b) means disposed in a first one of the separate signal channels and responsive to a phase modulating signal and the input signal for producing a phase modulated signal having a phase angle relative to the phase of the input signal which changes as a function of time;

(c) means, disposed in a second one of the separate signal channels and fed by the input signal, for shifting the phase

of the input signal an amount $\phi = Kf$ where K is a constant;

(d) means for combining the phase modulated signal and the phase shifted signal to produce a composite signal having the input signal as a carrier signal, and as the envelope thereof, a signal having the frequency of the modulating signal and a phase angle, relative to the phase modulating signal, proportional to the phase shift ϕ provided by the phase shifting means;

(e) phase detector means responsive to the composite signal and the phase modulating signal, for detecting the phase angle of the envelope of such composite signal relative to the phase of the phase modulating signal; and

(f) computer means responsive to the detected phase angle for determining the frequency of the input signal.

4,477,774

ELECTRICAL CONTACT DEVICE FOR AN ELECTRONIC CARD PROCESSING APPARATUS

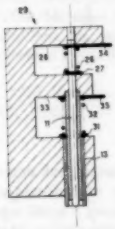
Michel Revirieux, Versailles, France, assignor to Electronique Marcel Dassault, Versailles, France

Filed Feb. 24, 1981, Ser. No. 237,564

Claims priority, application France, Feb. 28, 1980, 80 04486

Int. Cl.³ G01R *1/06, 31/02*

U.S. Cl. 324—158 P **5 Claims**



1. An electrical contact device for establishing an electrical connection between an electronic card having a plurality of contact terminal areas thereon and an access terminal which receives said card in a receiving means comprising:

a plurality of contact means, each including at least two separate conductive members, one of said members forming a sleeve to a remaining elongated member and insulated therefrom;

a support member for said conductive members, each of said conductive members mounted on said support member for independent movement relative to the support member in a direction transverse to the surface of the card received by said receiving means;

means for independently biasing said conductive members relative to said support member in a direction transverse to and toward the surface of said card to bring each of said two separate conductive members of each of said plurality of contact means into electrical contact with a terminal contact area of the card in said receiving means; and

circuit means for passing a current between said conductive members of each of said plurality of contact means through a respective of said terminal contact area.

4,477,775

METHOD AND APPARATUS FOR A FAST INTERNAL LOGIC CHECK OF INTEGRATED CIRCUITS

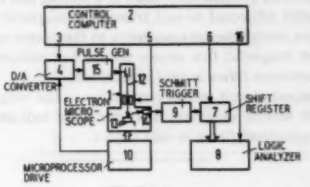
Peter Fazekas, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 23, 1981, Ser. No. 333,764

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1981, 3110140

Int. Cl.³ G01R *31/26;* G01N *23/00*

U.S. Cl. 324—158 R **11 Claims**



1. An apparatus for conducting a fast internal logic check of an integrated circuit with a fixed phase position sequence cycle, said apparatus comprising:

a means for directing a pulsed electron beam at an integrated circuit to be checked as a test probe;

a scan generator for selectively changing the position of said test probe from test location to test location for testing selected phases of said integrated circuit by generating a potential contrast signal at the test locations representing test values;

a means for receiving said potential contrast signal and generating a plurality of corresponding test values;

a logic analyzer for evaluating said test values; and

a means for sequentially controlling the positioning of said electron beam and evaluation of said test values.

4,477,776

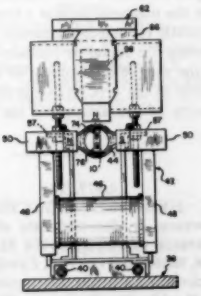
APPARATUS AND PROCESS FOR FLUX LEAKAGE TESTING USING TRANSVERSE AND VECTORED MAGNETIZATION

Edward Spierer, Belle Harbor, N.Y., assignor to Magnetic Analysis Corporation, Mount Vernon, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,467

Int. Cl.³ G01N *27/72;* G01R *33/12*

U.S. Cl. 324—227 **8 Claims**



1. Apparatus for providing simultaneous magnetic flux leakage detection of transverse and longitudinal flaws in an object relatively moving longitudinally and rotationally with respect to said apparatus, comprising:

(a) means for producing a transverse magnetic field in said object;

(b) means for producing a longitudinal magnetic field intersecting a portion of said transverse magnetic field to produce a vectored magnetic field in a first test region of said object;

(c) first magnetic flux sensor means for providing output signals in response to the presence of leakage flux produced by transverse flaws subjected to said vectored magnetic field in said first test region;

(d) second magnetic flux sensor means for providing output signals in response to the presence of leakage flux produced by longitudinal flaws in a second test region of said object subjected to said transverse magnetic field;

(e) first circuit means responsive to the output signals of said first magnetic flux sensor means for indicating detected transverse flaws in said object; and

(f) second circuit means responsive to the output signals of said second magnetic flux sensor for indicating detected longitudinal flaws in said object.

4,477,777

ANALYSIS OF BIOLOGICAL MATERIAL

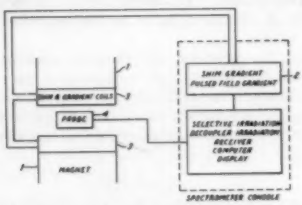
Roy E. Gordon, Oxford, England, assignor to Oxford Research Systems Limited, England

Filed Jun. 16, 1982, Ser. No. 389,064

Claims priority, application United Kingdom, Jun. 19, 1981, 8118949

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—300 **11 Claims**



1. A method of determining fats in a non ^{13}C enriched biological sample, which methods comprises subjecting the sample to a magnetic field, irradiating the sample with radiofrequency electromagnetic radiation, obtaining from the sample an electrical signal indicative of the radiofrequency absorption of the sample in the magnetic field at a frequency corresponding to the ^{13}C NMR resonance frequency for the $-(CH_2)_n-$ resonance, filtering the signal to exclude components due to absorption by the sample attributable to carbon atoms other than those present as the $-(CH_2)_n-$ groups and determining from the intensity of the absorption the fat content of the sample.

4,477,778

HYDROGEN DETECTOR

Samuel C. Lawrence, Jr. deceased, late of Seattle, Wash.; by Julia F. Lawrence executrix, 16414 Maplewild Ave. SW., Seattle, Wash. 98166, and Gary M. Lawrenson, King County, Wash., assignors to Lawrence Electronics Co. and Julia F. Lawrence, both of Seattle, Wash., a part interest

Filed Mar. 15, 1982, Ser. No. 357,865

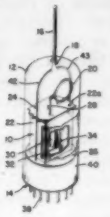
Int. Cl.³ G01N *27/62*

U.S. Cl. 324—466 **5 Claims**

1. A detector for a given gas, comprising:

a glass vacuum shell having most of its area not permeable as to said gas;

a palladium alloy membrane which is permeable as to said gas, said membrane being a tubular extension of said shell and connected thereto via a platinum collar on the root end of the membrane;



a heater element in said shell adjacent said membrane for heating the membrane; and

ionizing and ion collecting means for said gas in the shell.

4,477,779

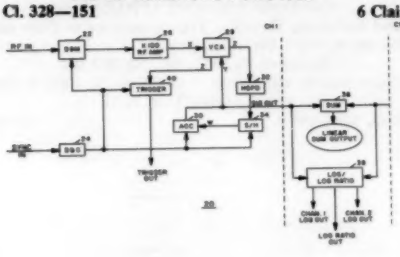
DUAL CHANNEL GATED PEAK DETECTOR

Robert W. Reed, State College, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 30, 1982, Ser. No. 403,688

Int. Cl.³ H03K *5/00, 17/00, 5/22*

U.S. Cl. 328—151 **6 Claims**



1. A dual channel gated peak detector comprising:

two signal channels, each of said signal channels having:

means for generating a gated signal from an input signal;

means for combining said gated signal with a gain control voltage to produce a constant peak level signal;

means for detecting said constant peak level signal to provide a peak level voltage; and

means for computing said gain control voltage for each cycle of said peak level signal such that said peak level voltage is constant in amplitude.

means for summing said gain control voltages from each of said signal channels to provide an output voltage inversely proportional to the amplitudes of said input signals to each of said signal channels.

4,477,780

OPERATIONAL AMPLIFIER WITH MULTIPLE SWITCHABLE OUTPUTS

Dewayne A. Spires, Plaistow, N.H., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

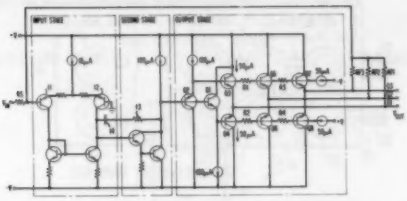
Filed Oct. 27, 1982, Ser. No. 437,110

Int. Cl.³ H03F *3/26, 1/34*; H03G *3/18*

U.S. Cl. 330—265 **7 Claims**

1. An operational amplifier comprising a first pair of complementary type transistors having their emitter-collector paths connected in series across a source of reference potential, the emitters of said transistors being connected to each other and to an output terminal, means for coupling a feedback resistance

from the output terminal to the input of the amplifier, a second pair of complementary type transistors being similarly connected across said reference potential, the emitters of said second pair being connected together and to a second output terminal, means for coupling a second feedback resistance from said second output to the input of the amplifier, a pair of resistors of predetermined values, each resistor being respectively



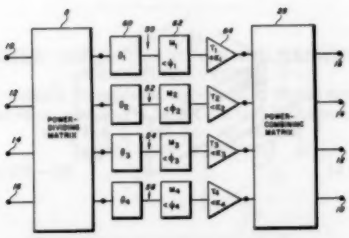
connected between the base electrodes of similar type transistors of said first and second pairs, and a pair of constant current sources respectively coupled to the base electrodes of said second pair of transistors, said second pair of transistors being reverse biased until the output voltage from said first pair of transistors equal or exceeds the voltage drop across at least one of said resistors at which time the second feedback resistance effectively shunts the first-mentioned feedback resistance.

4,477,781

COMBINED MICROWAVE PARALLEL AMPLIFIER- RF ATTENUATOR/MODULATOR

Max L. Reuss, Jr., New Carrollton, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 17, 1983, Ser. No. 467,430
Int. Cl.³ H03F *3/60*
U.S. Cl. 330—286 **17 Claims**



1. A parallel microwave amplifier comprising:

power-dividing matrix means with N input ports and N intermediate output ports where N is an integer greater than 1 for providing N intermediate output signals;

power-combining matrix means with N intermediate input ports and N output ports for accepting N intermediate input signals;

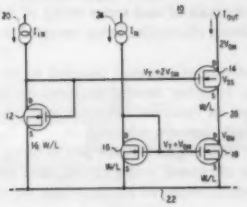
N amplification channels, interconnecting each of said intermediate output ports with a different one of said intermediate input ports, for connecting said power-dividing matrix with said power-combining matrix in a back-to-back configuration, wherein each of said amplification channels includes a phase-shifter, an attenuator, and an amplifier connected in series.

4,477,782

COMPOUND CURRENT MIRROR

Eric J. Swanson, Reading, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 13, 1983, Ser. No. 495,063
Int. Cl.³ H03F *3/16*
U.S. Cl. 330—288 **15 Claims**



1. A current amplifying apparatus comprising: at least two output current transistors, each having a conduction path and a control electrode, the conduction paths being connected in series with each other;

means for supplying output current in the current paths of said output transistors;

bias voltage means including, in association with each of said output transistors, an input current transistor having a conduction path and a control electrode, the control electrode of each of said input transistors being coupled to a point of the input current path and to the control electrode of said output transistor associated therewith, and

means for supplying an input current in the conduction paths of said input transistors,

said input transistors being devices for which the conduction path current is substantially proportional to the square of the minimum required voltage along the conduction path for operation in the saturated mode, multiplied by a constant factor related to the physical geometry of said input transistors, and

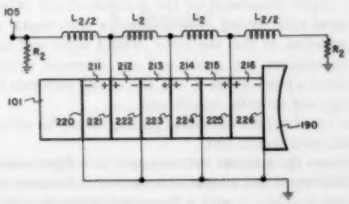
at least one of said input transistors having a geometry different from another of said input transistors, whereby for a given input current in their conduction paths, said one and said other input transistors generate different bias voltages on the control electrodes of the respective said output transistors associated with them.

4,477,783

TRANSDUCER DEVICE

William E. Glenn, Ft. Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Aug. 19, 1982, Ser. No. 409,429
Int. Cl.³ H03H *7/34, 9/13, 9/15*
U.S. Cl. 333—138 **4 Claims**



1. An ultrasonic transducer device, comprising:

a plurality of adjacent layers of polarized piezoelectric material, each layer having a polarization direction which is

opposite to the polarization direction of the adjacent layer;

conductive electrodes disposed on said layers of piezoelectric material such that each layer of piezoelectric material has electrodes on opposing surfaces thereof, with electrodes being shared between adjacent layers;

a series string of delay means, each including inductive elements alternating with connecting terminals;

every other electrode being coupled to respective connecting terminals of said series string of delay means, and the remaining electrodes being coupled to a common terminal;

an input/output terminal coupled to an end of said series string of delay means, an input or output signal being applied or received between said input/output terminal and said common terminal;

the time delay of each delay means being substantially equal to the ultrasonic wave propagation time through the piezoelectric material across which the delay means is coupled.

4,477,784

SURFACE WAVE DISPERSIVE ACOUSTIC DELAY LINE

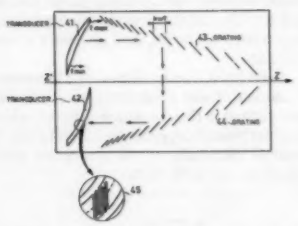
Charles Maerfeld, and Claude Lardat, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 27, 1982, Ser. No. 424,614

Claims priority, application France, Jan. 15, 1982, 82 00615

Int. Cl.³ H03H *9/44*

U.S. Cl. 333—153 **2 Claims**



1. A surface acoustic wave device for dispersing surface waves of a speed v operating in a frequency band of f_{min} and f_{max} comprising:

a substrate for supporting surface acoustic waves;

an input transducer means of the multi-electrode oblique alignment type having variable interval interdigital electrodes for producing acoustic waves;

an output transducer of the multi-electrode oblique alignment type having variable interval interdigital electrodes mounted so that the slope of said input and said output transducers are equal and are disposed symmetrically about a point on the Z'—Z axis of said substrate for receiving said acoustic waves; and

two variable interval slating grating means for reflecting said acoustic waves and,

wherein the interval between said interdigital electrodes of said input and output transducers is between $(nv/2f_{min})$ and $(nv/2f_{max})$ with n being an integer, and the two dispersive reflective gratings are slanted and the distance between said corresponding reflectors are respectively between (kv/f_{min}) and (kv/f_{max}) with k being another integer whose value is different from said value of n.

4,477,785

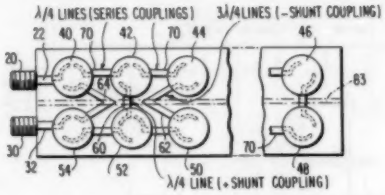
GENERALIZED DIELECTRIC RESONATOR FILTER

Ali E. Atia, Rockville, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Dec. 2, 1981, Ser. No. 326,643

Int. Cl.³ H01P *1/203, 7/10*

U.S. Cl. 333—202 **8 Claims**



1. A generalized canonical form filter for electromagnetic waves, comprising an input, an output and a plurality of dielectric resonators disposed between said input and said output, said resonators being serially coupled by series couplings of the same sign, physically adjacent but electrically non-adjacent resonators being coupled by shunt couplings of arbitrary sign, wherein said couplings comprise microstrip lines extending between said resonators, said lines terminating in arcuate portion having a radius originating at the centers of said resonators.

4,477,786

SEMI-COAXIAL CAVITY RESONATOR FILTER

Masahide Tamura, and Koga Daisuke, both of Samukawa, Japan, assignors to Toyo Communication Equipment Co., Ltd., Kouza, Japan

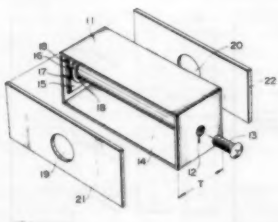
PCT No. PCT/JP82/00026, § 371 Date Sep. 27, 1982, § 102(e) Date Sep. 27, 1982, PCT Pub. No. WO82/02626, PCT Pub. Date Aug. 5, 1982

PCT Filed Jan. 26, 1982, Ser. No. 432,930

Claims priority, application Japan, Jan. 26, 1981, 56-10563

Int. Cl.³ H01P *1/205, 7/04*

U.S. Cl. 333—207 **6 Claims**



1. A semi-coaxial cavity resonator filter comprising:

a plurality of semi-coaxial cavity resonators each having an outer conductor formed in the shape of a tube of a predetermined length, an inner conductor provided in said outer conductor, one end of said inner conductor being secured to an inner wall of said outer conductor,

a dielectric substrate having a specific dielectric constant larger than 1 disposed in a gap formed between the other end of said inner conductor and the adjacent inner wall of said outer conductor, each side of said dielectric substrate having an electrode in contact therewith,

electrostatic capacity adjusting means for adjusting the electrostatic capacity between said electrodes, and

a shielding plate having a coupling window therein, said

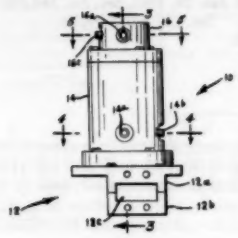
resonators being integrally connected in cascade via said shielding plate.

4,477,787

DUAL MODE DIRECTIONALLY COUPLED BAND REJECT FILTER APPARATUS

Herbert L. Thal, Jr., Tredyffrin Twp., Chester Co., Pa., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 19, 1983, Ser. No. 459,159
Int. Cl.³ H01P 1/208
U.S. Cl. 333—208 9 Claims



1. A dual mode directionally coupled band reject filter apparatus comprising in combination:

a waveguide housing containing a waveguide therein,

a first cylindrical cavity member mounted to the top of said waveguide housing, said first cylindrical cavity member containing a cavity means therein, said cavity means communicating with said waveguide through the broadwall of said waveguide housing, said cavity means being offset with respect to the centerline of said broadwall of said waveguide, and,

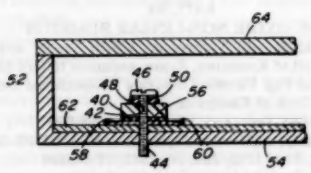
a second cylindrical cavity member mounted to the top of said first cylindrical cavity member, said second cylindrical cavity member coaxially aligned with said first cylindrical cavity member, said second cylindrical cavity member forming a second cavity therein, said second cavity communicating with said cavity means in said first cylindrical cavity means.

4,477,788

DIELECTRIC RESONATOR TUNER AND MECHANICAL MOUNTING SYSTEM

Jean C. Collinet, Georgetown, and Mark V. Slyke, Arlington, both of Mass., assignors to M/A Com, Inc., Burlington, Mass.

Filed Feb. 3, 1983, Ser. No. 463,348
Int. Cl.³ H01P 7/10, 1/203
U.S. Cl. 333—235 11 Claims



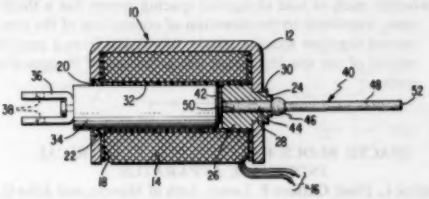
1. A combined mounting and tuning structure for a dielectric resonator comprising a base, in a stack on said base a dielectric resonator body, a resilient body of dielectric material and an electrical conductor, and means to fasten said stack to said base with said resilient dielectric between said resonator body and said electrical conductor, said fastening means being adjustable to provide a variable clamping force on said stack so as to tune the resonating frequency of said resonator body.

4,477,789

SOLENOID ARMATURE CUSHION

Basil Karlow, Anderson, S.C., assignor to The Singer Company, Stamford, Conn.

Filed Jul. 21, 1983, Ser. No. 515,827
Int. Cl.³ H01F 7/08
U.S. Cl. 335—257 3 Claims



1. In combination with a solenoid having a coil, an armature movable within a channel with respect to said coil, and a stop for limiting movement of said armature at one end of its travel, the improvement comprising means for cushioning the impact of said armature against said stop including a unitary cushion element formed of resilient material, said cushion element being elongated with a head portion at one end and a tail portion extending from said head portion, said tail portion being formed with an enlarged region spaced from said head portion, said stop being formed with a bore therethrough in the direction of travel of said armature, said head portion and said enlarged region being larger than said bore, the distance between said head portion and said enlarged region being substantially equal to the length of said bore, and the tail portion other than said enlarged region being smaller than said bore.

4,477,790

ELECTRICAL INDUCTIVE APPARATUS WITH COOLING CHANNELS

Bertil Moritz, Ludvika, Sweden, assignor to Asea Aktiebolag, Västerås, Sweden

Filed Feb. 22, 1982, Ser. No. 351,255
Claims priority, application Sweden, Feb. 24, 1981, 8101197
Int. Cl.³ H01F 27/08, 27/28
U.S. Cl. 336—60 4 Claims

1. An electrical inductive apparatus comprising:

a core of magnetic material with at least one leg and several yokes connected thereto;

at least one winding wound on said core and comprising a plurality of superimposed turns of sheet-formed electrically-conducting material;

at least one cooling channel element, defining with a surface

of at least one of said turns of said winding a plurality of channels for conducting an insulating fluid, in contact with a part of said surface from one to the other end face of the winding, said cooling channel element comprising a plurality of elongated spacing means disposed in substantially parallel spaced relationship in contact with said surface, and connecting means joining adjacent spacing means together, each said connecting means being spaced from the said surface to define with the latter and the two spacing means it connects at least some of said plurality of channels; and

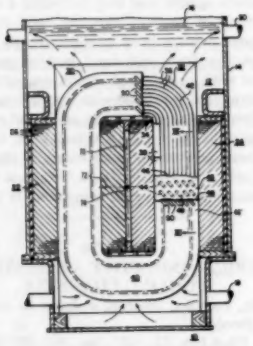
wherein each of said elongated spacing means has a thickness, transverse to the direction of connection of the connected together spacing means, increasing from a central region of the spacing means towards each of its opposite ends.

4,477,791

SPACER BLOCK PATTERN FOR ELECTRICAL INDUCTIVE APPARATUS

Patrick L. Thiel; Clifford F. Lawry, both of Muncie, and John G. DeNeef, New Castle, all of Ind., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 28, 1982, Ser. No. 437,374
Int. Cl.³ H01F *27/08*
U.S. Cl. 336—60 **5 Claims**



1. A winding assembly for fluid-cooled electrical inductive apparatus, comprising:

a core-coil assembly including a core leg having an axially extending core center line and a plurality of stacked pancake coils each having a plurality of conductor turns disposed about said core leg;

and at least one spacer insulating sheet washer disposed between adjacent pancake coils, each washer having upper and lower straight ends, four curved corners, and two straight leg portions coextensive with corresponding portions of the pancake coils;

each washer having a plurality of rectangularly shaped blocks having a geometric center and a longitudinal axis which extends through said centers, said blocks extending outwardly from at least one side of its associated washer and in contact with a pancake coil;

said blocks being disposed in predetermined spaced relation comprising a plurality of blocks arranged in spaced rows;

said spaced rows being vertically oriented in the upper and lower end portions, horizontally oriented in the two leg portions, and oriented at substantially a 45 degree angle in the four corner portions,

the rows of each washer all being located with reference to the core center line, to align the rows throughout the stack of pancake coils,

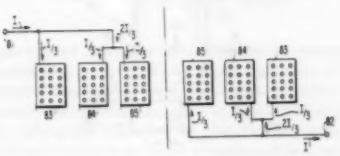
the blocks of any one row all having a like orientation, with said blocks being oriented with their longitudinal axes at substantially a 45 degree angle with respect to a line drawn through the centers of the blocks.

4,477,792

MODULAR POWER SYSTEM REACTOR

Thomas H. Putman, Penn Hills, Pa.; Andrew S. Sweetana, Jr., Bloomington, and Frederick J. Brown, Ellettsville, both of Ind., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 29, 1982, Ser. No. 344,258
Int. Cl.³ H01F *27/28*
U.S. Cl. 336—180 **4 Claims**



1. A reactor comprising:

three or more self-supporting generally cylindrical modules of which each of said modules comprises a conductive cable helically wound in a plurality of turns about a centerline with means for supporting said turns, said turns including a number of turns in each of a plurality of planes perpendicular to said centerline, and said cable has terminal means at each end thereof;

means electrically connecting said terminal means of said modules so said cables of said modules are electrically in parallel;

said modules being radially juxtaposed concentrically about a common centerline with each having substantially the same dimensions parallel to said centerline; and

said modules having varying numbers of said turns with the radially outermost of said modules having a greater number of turns than its radially inside adjacent module and each of the others of said modules that is radially inside another of said modules having a greater number of said turns than its radially outside adjacent module for substantial current balance among all of said modules.

4,477,793

ZINC OXIDE NON-LINEAR RESISTOR

Kazuo Mukae; Satoshi Maruyama; Koichi Tsuda, and Ikuo Nagasawa, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd. and Fuji Electric Corporate Research and Development, Ltd., both of Kanagawa, Japan

Filed Jun. 29, 1983, Ser. No. 509,080
Claims priority, application Japan, Jun. 30, 1982, 57-113292; Jun. 30, 1982, 57-113293; Jun. 30, 1982, 57-113294
Int. Cl.³ H01C *7/10*; H01B *1/08*
U.S. Cl. 338—21 **2 Claims**

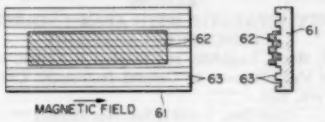
1. A voltage non-linear resistor comprising a sintered body composed of a main component of zinc oxide, and additives of (i) a total of 0.08 to 5.0 atomic % of at least one rare earth element; (ii) 0.1 to 10.0 atomic % of cobalt; (iii) 5×10^{-4} to 1×10^{-1} atomic % of boron; and (iv) a total of 1×10^{-4} to 5×10^{-2} atomic % of at least one component selected from the group of aluminum, gallium, and indium.

4,477,794

MAGNETORESISTIVE ELEMENT

Noboru Nomura, Kyoto; Kenji Kanai, Osaka; Nobuyuki Kaminaka, Osaka, and Yuji Omata, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 10, 1982, Ser. No. 406,894
Claims priority, application Japan, Aug. 10, 1981, 56-124005; Dec. 11, 1981, 56-198387; Dec. 11, 1981, 56-198388
Int. Cl.³ G11B 5/30
U.S. Cl. 338—32 R 17 Claims



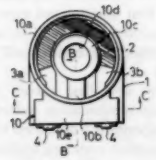
1. A magnetoresistive element comprising a substrate, a magnetoresistive film of a ferromagnetic body formed on said substrate, and at least two electrodes disposed on said magnetoresistive element, wherein a linear grating pattern is unidirectionally formed on at least one surface of said magnetoresistive film.

4,477,795

ROTARY ELECTRIC COMPONENT

Shoichi Henmi; Junichi Imura, and Isao Moriya, all of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 431,385
Claims priority, application Japan, Feb. 16, 1982, 56-20460[U]
Int. Cl.³ H01C 10/32
U.S. Cl. 338—163 6 Claims



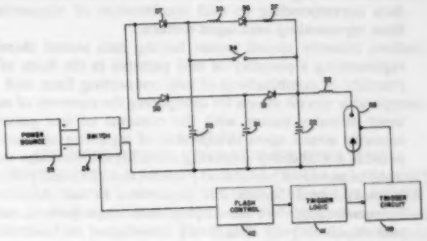
1. A rotary electric component comprising:
(a) an insulating substrate having a hole adapted to receive a rotary shaft;
(b) a resistor mounted on said insulating substrate surrounding said hole;
(c) a pair of electrodes mounted on said insulating substrate and connected to said resistor at respective ends thereof;
(d) a pair of terminals mounted on said insulating substrate and connected to said electrodes, respectively;
(e) a shaft rotatably mounted in said hole and having a movable contact held in sliding contact with said resistor;
(f) a cover mounted on said shaft to lie over at least portions of said insulating substrate and said terminals, said cover covering said movable contact and having a skirt spaced from said insulating substrate by a gap to clear said terminals; and
(g) means including a separate body of synthetic resin mounted on said insulating substrate and having a portion forming a dust wall covering said gap.

4,477,796

SPATIAL ACQUISITION FLASH BEACON

Wayne A. Kearsley, 15 Rangeway Rd., Mont Vernon, N.H. 03057

Filed Sep. 29, 1982, Ser. No. 427,968
Int. Cl.³ B60Q 1/00
U.S. Cl. 340—105 7 Claims



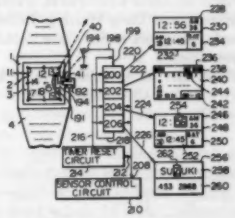
1. A method of operating a light beacon for improved attention gathering and better spatial acquisition ease comprising:
(a) Discharging a first light flash of between 50 microseconds and 10 milliseconds duration at a first energy level;
(b) discharging a burst of at least four light flashes, each having less than one fourth the energy of said first light flash, following said first light flash and terminating at least 100 milliseconds after the beginning of said first light flash; and,
(c) repeating the above first light flash and the above burst at an established rate.

4,477,797

DATA INPUT DEVICE FOR ELECTRONIC DEVICE

Tadahiko Nakagiri, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 328,986
Claims priority, application Japan, Dec. 12, 1980, 55-175614; Dec. 12, 1980, 55-175615; Dec. 12, 1980, 55-175621; Dec. 26, 1980, 55-184079; Dec. 26, 1980, 55-184080; Dec. 26, 1980, 55-184081; Dec. 26, 1980, 55-184082; Jan. 13, 1981, 56-3496
Int. Cl.³ G08C 9/00
U.S. Cl. 340—365 S 5 Claims



1. A data input device for inputting data in the form of patterns to an electronic device, comprising:
an array of sensor elements arranged in predetermined fixed positions, each of said sensor elements being individually actuatable for generating an electrical signal, said inputting of data being performed for each of said patterns by manually tracing out a combination of connecting lines between pairs of said sensor elements, said combination of connecting lines representing the shape of said input pattern, with a plurality of said sensor elements being successively actuated in the course of tracing out said combination of connecting lines;
connecting line discrimination circuit means responsive to

said electrical signals from said sensor elements for generating output signals corresponding to pairs of said sensor elements for which successive actuations occur during tracing out of said input pattern, said output signals thereby corresponding to said connecting lines of said input pattern;

input memory means responsive to said output signals from said connecting line recognition circuit means, for storing data corresponding to said combination of connecting lines representing said input pattern;

pattern memory circuit means having data stored therein representing a plurality of said patterns in the form of a plurality of combinations of said connecting lines; and

comparator circuit means for comparing the contents of said input memory means with the contents of said pattern memory means upon completion of inputting said input pattern, for thereby detecting coincidence between said input pattern and one of said patterns stored in said pattern memory circuit means, and responsive to said detection for generating data identifying said input pattern, said pattern identifying data being transferred to said electronic device;

in which each of said combinations of connecting lines representing a pattern stored in said pattern memory means comprises a partial set of connecting lines selected out of the total number of connecting lines by which said stored pattern is represented when stored in said first memory means through actuation of said sensor elements, said partial set of connecting lines being the minimum combination of connecting lines which will uniquely define said store pattern in relation to all other input patterns stored in said pattern memory means, when comparison between the contents of said input memory means and pattern memory means is performed;

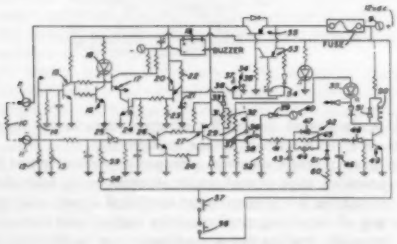
in which said comparator circuit means is operative to sequentially compare said input pattern represented by the contents of said input memory means with each of said plurality of patterns represented by the contents of said pattern memory means, for thereby recognizing said input pattern; and

in which said comparator circuit means performs said sequential comparison beginning with a pattern stored in said pattern memory means comprising a set of said connecting lines which overlaps a maximum number of other ones of said patterns stored in said pattern memory means.

4,477,798
FIRE ALARM CONTROL SYSTEM

Ben Saul, Montreal, and Doug Hartley, Dollard des Ormeaux, both of Canada, assignors to Sur-Gard Security Systems Ltd., Mount Royal, Canada

Filed Apr. 26, 1982, Ser. No. 372,069
Int. Cl.³ G08B *23/00*
U.S. Cl. 340—527 **10 Claims**

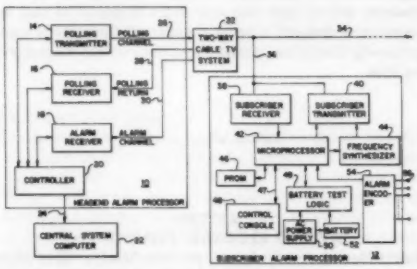


1. A fire alarm control system comprising electronic switch means responsive to an increase input current signal generated by one or more alarm detection devices, local alarm means connected to said electronic switch means to indicate an alarm state, a delay timer circuit connected to said electronic switch means and operated thereby to activate a remote alarm means after a predetermined time delay, a manual two-position switch movable to a silence position from its normal position within said time delay to disable said local and remote alarm means and movable back to its normal position to cut off power to said detection devices and electronic switch means to unlatch both said local and remote alarm means, and further manually operable switch means to instantaneously reactivate said disabled local and remote alarm means when said two-position switch is in said normal position.

4,477,799
SECURITY APPARATUS WITH ALARM SEARCH AND VERIFICATION CAPABILITY

Joseph D. Rocci, Lansdale, and Stephen E. Crook, Horsham, both of Pa., assignors to General Instrument Corporation, New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,302
Int. Cl.³ G08B *1/00, 26/00*
U.S. Cl. 340—533 **3 Claims**



1. A security apparatus for transmitting alarm messages over a cable communication system, said cable communication system coupled to a headend alarm processor including means for generating first and second search commands, and means for transmitting said first and second search commands over said cable communication system, said security apparatus having an address associated therewith, said security apparatus comprising:

means responsive to said first search command received over said cable communication system for generating a reply message response if a specified bit in said address of said security apparatus matches a specified address bit in said first search command, and said security apparatus detects an alarm condition, and said security apparatus has not previously generated a reply message response to a previous first search command; and

means responsive to said second search command received over said cable communication system for generating a reply message response if a specified bit in said address of said security apparatus matches a specified address bit in said second search command, and said security apparatus detects an alarm condition, and said security apparatus has previously generated a reply message response to a previous first or second search command.

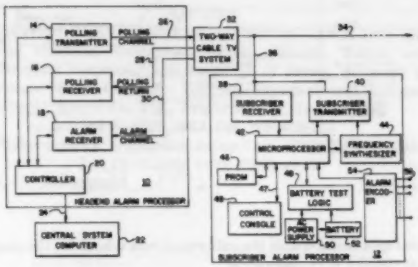
4,477,800
SECURITY SYSTEM

Thomas E. O'Brien, Warminster, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,304
Int. Cl.³ G08B *1/00, 26/00*
U.S. Cl. 340—533 **2 Claims**

1. A subscriber security apparatus for use in a cable communication system having a headend alarm processor for provid-

ing polling messages modulating a first radio frequency signal propogating over said cable communication system from said headend alarm processor, said cable communication system also propogating second and third radio frequency signals to said headend alarm processor, said security apparatus comprising:



means responsive to said polling messages modulating said first radio frequency signal for providing polling return messages modulating said second radio frequency signal; and

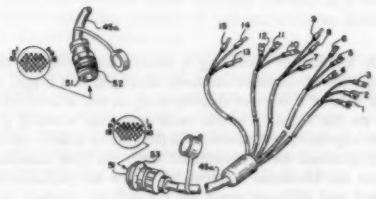
means responsive to an alarm condition for providing an alarm message essentially when said alarm condition is first detected, said alarm message modulating said third radio frequency signal.

4,477,801

SEED MONITOR APPARATUS HARNESS ADAPTER FOR A CONVERTIBLE PLANTER

Edward L. Robinson, Jr., Naperville, and Augustyn M. Gesior, Clarendon Hills, both of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Mar. 15, 1982, Ser. No. 358,070
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—684 **4 Claims**



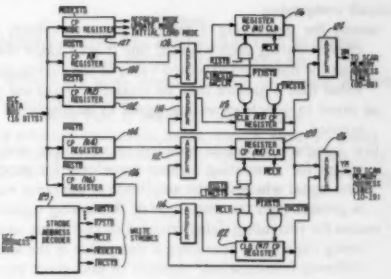
1. In a multi-row planter having a plurality of seed dispenser equipped row units, a portion of said plurality of units being operatively disconnectable from said planter, a remaining portion of said row units being operative, a plurality of seed detecting circuit means respectively associated with the dispensers of the plurality of row units, readout display means, logic circuit means coupled between said plurality of seed detecting circuit means and said readout display means and responsive to output signals from said seed detecting circuit means for energizing said readout display means to identify which of said plurality of dispensers is operating improperly, wherein the improvement comprises: a quick attachable adapter, usable when said portion of said dispenser equipped row units are disconnected, that is insertable between said plurality of seed detecting circuit means and said logic circuit means and connecting the seed detecting circuit means associated with said remaining portion of said row units to said logic circuit means while isolating the seed detecting circuit means associated with the disconnected units, said adapter also connecting said logic circuit means in a continuous series of connections to provide a display for said remaining portion of said seed dispenser row units.

4,477,802

ADDRESS GENERATOR FOR GENERATING ADDRESSES TO READ OUT DATA FROM A MEMORY ALONG ANGULARLY DISPOSED PARALLEL LINES

Chris J. Walter, Columbia, Md., and Gerald A. Brumm, Boca Raton, Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 17, 1981, Ser. No. 331,723
Int. Cl.³ G09G *1/16*
U.S. Cl. 340—727 **15 Claims**



1. An Address generator for generating addresses enabling a memory device, having memory elements arranged along orthogonal rows and columns to store data and to output stored data in a predetermined sequence in response to X and Y starting addresses and first and second incremental X and Y correction values received from a computer characterized in that such address generator comprises:

first means for repetitively adding the first incremental Y correction value to the X starting address to generate a row corrected X starting address having a value equal to said X starting address plus N times said first incremental Y value where N is the row number

second means for repetitively adding the first incremental X correction value to itself to generate a first address correction having a value equal to M times the first incremental X correction value where M is the column number;

third means for summing said row corrected X starting address with said first X address correction to generate X addresses;

fourth means for repetitively adding the second incremental Y correction value to said Y starting address to generate a row corrected Y starting address having a value equal to the Y starting address plus N times the second incremental Y correction value where N is the row number;

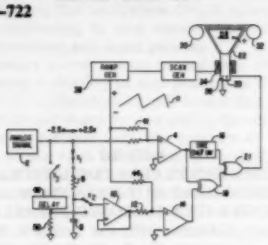
fifth means for repetitively adding the second incremental X correction value to itself to generate a second address correction having a value equal to M times incremental X correction value where M is the column number; and

sixth means for summing said line corrected Y address with said second address correction to generate Y addresses.

4,477,803
STRIPCHART RECORDER INTENSITY ENHANCEMENT

Richard J. Conrad, Hamilton, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 2, 1981, Ser. No. 317,090
Int. Cl.³ G09G 1/16
U.S. Cl. 340—722 **5 Claims**



1. In apparatus for displaying an analog wave on the face of a cathode ray tube in which the electron beam is made to scan parallel lines in succession separated by a given interval, a circuit comprising

means for generating a ramp voltage waveform that increases during each scanned line from a value that is less than the minimum expected value of the analog signal to a value that is greater than its maximum expected value,

an input to which an analog signal to be displayed may be applied,

first comparison means coupled to said input and to said means for generating a ramp waveform for producing a first signal whenever the amplitude of the ramp waveform is greater than the amplitude of the analog signal,

means for providing delay coupled to said input, said means being capable of providing a delay that is the same as or different from a whole multiple of said given interval,

second comparison means coupled to the output of said means for providing delay and to said means for generating a ramp waveform for producing a second signal whenever the amplitude of the ramp waveform is greater than the amplitude of the delayed analog signal, and

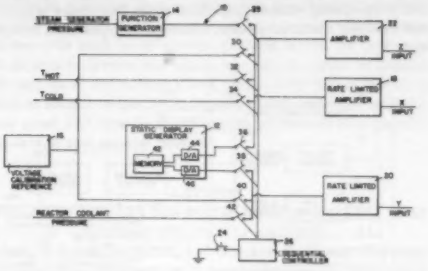
means responsive to said first and second signals for producing a signal that can change the intensity of the beam of the cathode ray tube between the times when said first and second signals occur.

4,477,804
ELECTRICAL CIRCUIT FOR PROVIDING AN ABNORMAL TRANSIENT DISPLAY SYSTEM FOR NUCLEAR REACTOR OPERATION

Robert C. Roberts, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 1, 1982, Ser. No. 353,751
Int. Cl.³ G07G 1/02
U.S. Cl. 340—747 **3 Claims**

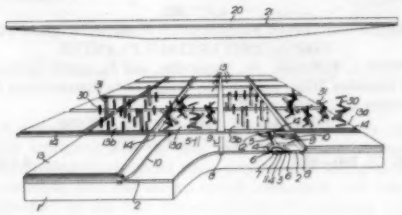
1. An electrical circuit for sampling and displaying data on a display device comprising memory means having a static graphical display stored therein including a calibration box, means for monitoring a plurality of data inputs, and means for transferring said static graphical display to a display device, said transferring means further including means for sampling said data inputs and transferring said data to the display device for display on the graphicl display and means for calibrating said graphical display to insure the accuracy thereof including a first switch to actuate the memory means to display the calibration box on the graphical display and a second switch to actuate a calibration spot on the graphic display, said calibration spot being within the calibration box whenever the graphical display is in calibration.



4,477,805
MATRIX ADDRESSING OF DISPLAY DEVICES

Kenneth A. M. Arton, Harlow, and George H. S. Rokos, Bishops Stortford, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 4, 1981, Ser. No. 270,327
Claims priority, application United Kingdom, Jun. 19, 1980, 8020074
Int. Cl.³ G09G 3/36
U.S. Cl. 340—784 **12 Claims**



1. A method of operating a matrix array display device having a set of electrode elements arranged in a matrix array on one side of a layer of display medium and a counter-electrode on the other, wherein each electrode element of the array is repetitively addressed via the gate of a semiconductor device accessed on a coordinate basis via row conductors, wherein the electrode elements of a row are simultaneously accessed and different rows are repetitively strobed so that they are sequentially accessed and the matrix elements thereby repetitively refreshed, wherein regions of the layer of display medium between the counter-electrode and selected electrode elements are rendered visually distinguishable from regions of the layer between the counter-electrode and the remaining electrode elements by the establishment of an r.m.s. potential difference exceeding a threshold value between the counter-electrode and the selected electrode elements while substantially no potential difference is maintained between the counter-electrode and the remaining electrode elements, wherein the potential difference between the counter-electrode and the selected electrode elements is periodically reversed by switching the potential of the counter-electrode between two levels and by subsequently switching the potentials of the selected electrode elements on accessing of the respective rows in substantial antiphase between substantially the same two levels, wherein said switching occurs at a repetition frequency providing a plurality of addressings of each electrode element within the duration of each potential level of the counter-elec-

trode, and wherein only immediately each time the counter-electrode potential is switched all of the electrode elements of all rows are first simultaneously set to the same potential as the counter-electrode potential and thereafter normal strobing of the electrode elements is resumed.

4,477,806

MISCHIEF PREVENTIVE ELECTRONIC LOCK DEVICE

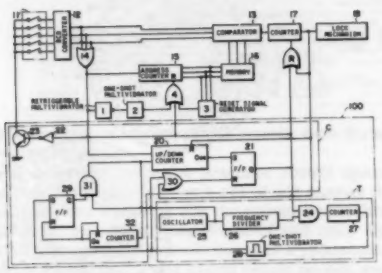
Haruo Mochida, Yokohama; Kelichi Shimizu, Tokyo, and Hirotoshi Namazue, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa and Kokusan Kinzoku Kogyo Co. Ltd., Tokyo, both of, Japan

Filed Sep. 29, 1982, Ser. No. 428,236

Claims priority, application Japan, Oct. 2, 1981, 56-156098

Int. Cl.³ H04Q *9/00;* **E05B** *49/00*

U.S. Cl. 340—825.32 **18 Claims**



1. In an electric lock device including a lock mechanism, a push-button input unit for entry of an input code, a memory for storing a preset code which can be read out in response to input of said input code, a comparator for comparing said input code with said preset code to produce a drive signal for actuating said lock mechanism to either of a locking and an unlocking position when said input code and said preset code match, a mischief preventive system comprising:

a counter for counting occurrences of all input pushbutton keystrokes via said input unit and producing a counter signal when the number of said occurrences reaches a predetermined value, and

disabling means, associated with said input unit and responsive to said counter signal, for disabling said input unit to disable further input occurrences therefrom for a predetermined period of time, said disabling means operable after expiration of said predetermined period of time for permitting a given number of occurrences of input via said input unit after said input unit is once disabled.

4,477,807

RADIO PAGER WITH DISPLAY DEVICE

Takeshi Nakajima, and Takashi Ohyagi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1982, Ser. No. 385,140

Claims priority, application Japan, Jun. 10, 1981, 56-89789

Int. Cl.³ G08B *5/22*

U.S. Cl. 340—825.44 **12 Claims**

1. A radio pager comprising:

means for receiving and demodulating a carrier wave modulated with a selective calling signal and a message signal to provide demodulated selective calling and message signals;

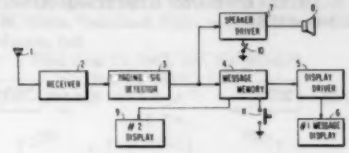
means for detecting from said demodulated selective calling signal a selective calling signal assigned to said radio pager to provide a detected signal;

means responsive to said detected signal for delivering an alert signal;

first memory means for storing said demodulated message signal;

second memory means for respectively storing a plurality of message signals from said first memory means;

first display means for displaying one of said message signals stored in said second memory means; and



means for comparing the message signal stored in said first memory means with said plurality of message signals stored in said second memory means and transferring said message signal from said first memory means to said second memory means when all of said message signals stored in said second memory means differ from said message signal in said first memory means.

4,477,808

RADIO PAGING RECEIVER HAVING STORED MESSAGE PROTECTION MEANS

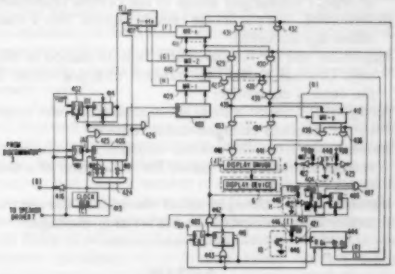
Yoshio Ichikawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 462,867

Claims priority, application Japan, Feb. 1, 1982, 57-13343

Int. Cl.³ H04Q *7/00;* **H04M** *11/00;* **G08B** *5/22;* **H04B** *1/16*

U.S. Cl. 340—825.44 **10 Claims**



1. A radio paging receiver comprising:

means for receiving and demodulating a carrier wave modulated with paging and message signals to provide demodulated paging and message signals;

means for detecting, out of said demodulated paging signals, the paging signal assigned to said radio paging receiver to provide a detection signal;

means responsive to said detection signal for generating an alert signal;

first memory means for storing a plurality of said demodulated message signals;

second memory means for preventing from erasure and storing at least one of the message signals stored in said first memory means;

display means for displaying at least one of the message signals stored in said first and second memory means; and

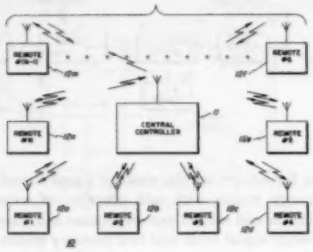
display control means connected to said first and second memory means and said display means for selectively providing said display means with at least one of the message signals stored in said first and second memory means.

4,477,809

METHOD FOR RANDOM-ACCESS RADIO-FREQUENCY DATA COMMUNICATIONS

Sanjay K. Bose, Kanpur, India, assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 18, 1982, Ser. No. 389,533
Int. Cl.³ H04B *3/60, 17/00;* **H04Q** *7/00*
U.S. Cl. 340—825.54 **34 Claims**



1. A method for random-access data communications from and to a central controller, to and from at least one of a plurality of remote stations, comprising the steps of:

providing at least one radio-frequency channel having the bandwidth thereof allocated into at a message channel portion and an acknowledgement channel portion;

transmitting data between at least one of the remote stations and the central controller on the message channel portion;

acknowledging receipt of data at the central controller by a signal sent on the acknowledgment channel portion to at least the remote station transmitting the data;

normally operating the system to require each remote station to report unchanged status to the central controller;

determining, at a particular remote station, that a change of status has occurred;

requesting use by the particular remote station of the message channel portion to transmit changed-status data to the central controller;

recognizing an alert state at the central controller responsive to the received changed-status request;

transmitting from the central controller to the requesting remote station authorization for transmittal of a changed-status message; and

transmitting the changed-status message to the central controller after receipt of the authorizing message.

4,477,810

CAPACITY TYPE ROTATION DETECTING APPARATUS

Hiroaki Tanaka, and Shigeyuki Akita, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 1, 1982, Ser. No. 413,898
Claims priority, application Japan, Sep. 7, 1981, 56-139732
Int. Cl.³ G08C *19/10*
U.S. Cl. 340—870.37 **7 Claims**

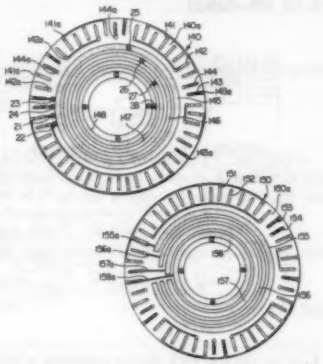
1. A capacity type rotation detecting apparatus comprising:

a first plate having a plurality of electrode pieces of a first input electrode and a plurality of electrode pieces of a second input electrode arranged along a circumference at respective equally given intervals and contiguously intermeshed, said first input electrode pieces forming a first input reference angular position detection electrode comprising a set of said first input electrode pieces selected at respective different intervals and further forming a first input rotational angle detection electrode comprising a set of said first input electrode pieces other than said first input reference angular position detection electrode pieces, and said second input electrode pieces forming a second input reference angular position detection electrode comprising a set of said second input electrode pieces each thereof being positioned adjacent to one of said first input reference angular position detection electrode pieces on one side thereof and further forming a second input rotational angle detection electrode comprising a set of said second input electrode pieces other than said second input reference angular position detection electrode pieces,

a second plate having output reference angular position detection electrode means arranged to face said first and second input reference angular position detection electrodes and output rotational angle detection electrode means arranged to face said first and second input rotational angle detection electrodes;

a first periodic signal supply circuit for supplying periodic signals of opposite phase to said first and second input reference angular position detection electrodes;

a second periodic signal supply circuit for supplying periodic signals, which are of opposite phase to each other and have a repetition period different from that of said periodic signals supplied to said first and second input reference angular position detection electrodes, to said first and second input rotational angle detection electrodes;



a reference angular position signal generating circuit for generating a reference angular position signal in response to signals generated at said output reference angular position detection electrode means when said second plate is rotated relative to said first plate;

a rotational angle signal generating circuit for generating a rotational angle signal in response to signals generated at said output rotational angle detection electrode means; and

signal transmitting means for transmitting signals between said second plate and said first plate which is fixed.

4,477,811

AUTOMATIC MDS LEVEL ANALYZER

Edward Collins, IV, Monte Sereno, Calif., assignor to California Microwave, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 54,289, Jul. 2, 1979, abandoned. This application Aug. 14, 1981, Ser. No. 292,775
Int. Cl.³ G01S *7/40*
U.S. Cl. 343—17.7 **13 Claims**

1. An analyzer for evaluating the low signal level detecting capabilities of a receiver responsive to receiver driving pulses to develop noisy signal pulses and which generates noise during quiescent periods, comprising:

pulse generator means for generating a series of receiver driving pulses having amplitudes determined by a pulse generator control signal, which is coupled into an input of the receiver under test;

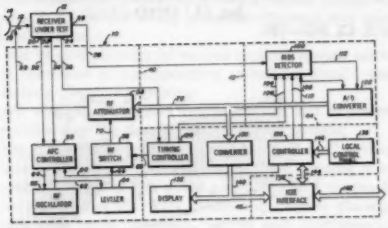
level controller means for a first comparison of

the instantaneous amplitude of the noise generated at an output of said receiver and the level of a threshold signal

during a series of first sample periods, each during one of said quiescent periods,

thereby adjusting the level of said threshold signal such that during each one of said first sample periods the average period during which the instantaneous amplitude of said noise exceeds said threshold signal is a predetermined portion of said first sample periods, and for a second comparison of

the instantaneous amplitude of the noisy signal pulses generated at the output of said receiver and said threshold signal



during a series of second sample periods, each during a noisy signal pulse,

thereby generating said pulse generator control signal to maintain the amplitude of each one of said receiver driving pulses at a level such that the average period during which the instantaneous amplitude of said noisy signal pulses exceeds said threshold signal is a predetermined portion of said one of said second sample periods; and

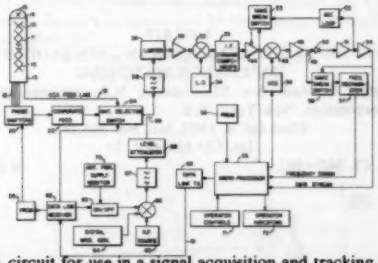
display means for indicating the amplitude of said receiver driving pulses to provide an indication of the low signal level detecting capabilities of said receiver.

4,477,812

SIGNAL ACQUISITION AND TRACKING SYSTEM

Belmont Frisbee, Jr., and Charles E. Swedblom, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 29, 1981, Ser. No. 268,303
Int. Cl.³ G01S *5/02*
U.S. Cl. 343—417 **18 Claims**



1. A circuit for use in a signal acquisition and tracking system in a known frequency range with a signal of known modulation characteristics comprising:

means for receiving electromagnetic signals originating omnidirectionally in azimuth with respect to a predetermined location and from within a narrow beam width which is of variable elevation:

a tuning network varying the frequency received over said frequency range operably connected to said receiving means; and

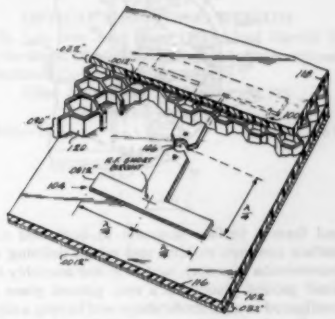
means for controlling the variation in elevation of said receiving means sensitivity and for simultaneously and selectively controlling the frequency variation accomplished by said tuning network, operably connected to said receiving means and said tuning network.

4,477,813

MICROSTRIP ANTENNA SYSTEM HAVING NONCONDUCTIVELY COUPLED FEEDLINE

Michael A. Weiss, Nederland, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Aug. 11, 1982, Ser. No. 407,079
Int. Cl.³ H01Q *1/38*
U.S. Cl. 343—700 MS **23 Claims**



1. A microstrip antenna system comprising:

an electrically conductive reference surface;

a layer of electrically conductive microstrip radiator structure disposed above said reference surface by a first predetermined distance less than one-tenth wavelength at the intended antenna operating frequency, said radiator structure including at least one conductively isolated two dimensional conductive area having a resonant dimension of substantially one-half wavelength at said operating frequency; and

a layer of electrically conductive microstrip feedline structure disposed intermediate said reference surface and said layer of radiator structure, said feedline structure including at least one predetermined coupling location positioned an odd integer number of one-fourth wavelength(s) from an effective r.f. short circuit to the underlying reference surface thus causing a concentration of electromagnetic fields to occur at the coupling location which is also disposed proximate to a predetermined corresponding feedpoint region of said radiator structure such that the concentrated electromagnetic fields operate to nonconductively couple r.f. energy to/from said radiator structure from/to said feedline structure.

4,477,814

DUAL MODE RADIO FREQUENCY-INFRARED FREQUENCY SYSTEM

Charles T. Brumbaugh, Fullerton; Robert L. Pittenger, Orange, and Robert M. Klees, Costa Mesa, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 2, 1982, Ser. No. 404,096
Int. Cl.³ H01Q *3/14, 21/28, 19/18*
U.S. Cl. 343—725 **7 Claims**

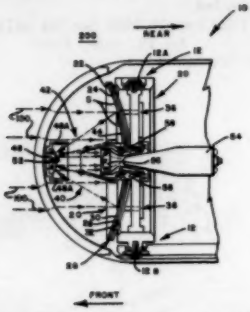
1. A dual mode radio frequency-infrared frequency seeker system, comprising:

a. means for seeking, sensing, radiating and absorbing radio frequency energy, wherein this means is mounted on a gimbal means and includes a radio frequency antenna having a surface; and

b. means for seeking, sensing, reflecting, and focusing infrared frequency energy, wherein this means is also mounted on said gimbal means and includes a Cassegrain infrared

frequency optical subsystem having a primary mirror with a surface, and wherein this means is operably associated with and is in coaxial relationship with said means for seeking, sensing, radiating and absorbing radio frequency energy;

and wherein said surface of said radio frequency antenna and said surface of said primary mirror are the same surface



and form a surface common to both said means, said surface common to both said means defining a strip line transmission assembly, said strip line assembly including a front ground plane and a rear ground plane and being configured in a parabolic shape and having a stip transmission line disposed between said front ground plane and said rear ground plane.

4,477,815

RADOME FOR GENERATING CIRCULAR POLARIZED ELECTROMAGNETIC WAVES

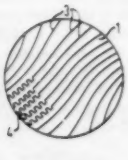
Anton Brunner, Wangen, and Klaus Rieskamp, Soecking, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 8, 1981, Ser. No. 281,314

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1980, 3027093

Int. Cl.³ H01Q *15/24*

U.S. Cl. 343—756 **5 Claims**



1. A re-polarization device for generating circularly polarized electro-magnetic waves by using a layered lattice structure which respectively consists of a plurality of conductors extending in the form of meander lines, of line rectangle combinations which are mounted in front of a radiation aperture of a parabolic mirror which radiates signals with E-vectors which are not parallel to each other and are distorted across the surface and said radiation comprising linearly polarized electro-magnetic waves which have cross-polarization components over the aperture which are not parallel to each other characterized in that the longitudinal direction of said meander lines (4) of the lattice structure (3) mounted in front of the radiation aperture (1) are at all locations oriented such that they extend in longitudinal directions which are inclined at 45° relative to the E-vector (2) at each location of the E-vector field of the incident wave to be re-polarized so as to convert said E-vector field into circular polarization, characterized that said polarization device is used as an aperture cover of a parabolic antenna, and characterized in that the antenna is a target tracking radar antenna with a covered reflector mirror and the lattice structure is contained in the reflector aperture covering.

4,477,816

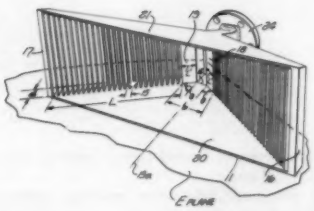
CORRUGATED ANTENNA FEED HORN WITH MEANS FOR RADIATION PATTERN CONTROL

Ching F. Cho, Tujunga, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Jul. 14, 1982, Ser. No. 398,061

Int. Cl.³ H01Q *13/02*

U.S. Cl. 343—786 **8 Claims**



1. An electromagnetic horn antenna comprising: a rectangular waveguide: a hollow body having a predetermined E plane flare angle and having a throat connecting to said rectangular waveguide, said body having a first pair of opposing flared internal walls and a second pair of parallel internal walls; a plurality of uniformly spaced corrugations in said first pair of walls, said throat having flared uncorrugated portions adjacent corrugations in each of said first pair of walls, dividing lines between said uncorrugated portions and said corrugations defining a transition plane normal to the axis of said body, said corrugations having their elongated dimensions extending substantially perpendicular to said E plane and substantially from the outer extremity of said horn over a predetermined dimension L measured along each of said first walls toward said throat to the intersection of said transition plane, said transition plane having an E plane width of b, such that $\sin^{-1}(0.8\lambda/b)$ is less than the E plane flare angle θ of said horn.

4,477,817

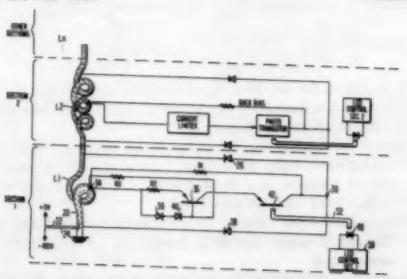
SWITCHING CIRCUIT INCLUDING PIN DIODES FOR IMPEDANCE MATCHING

Wendell G. Anderson, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 8, 1982, Ser. No. 396,280

Int. Cl.³ H01Q *1/50*

U.S. Cl. 343—861 **6 Claims**



1. In a system for matching the impedance of an antenna to

the impedence presented by one of a transmitter or a receiver, said system including a variable impedance matching network coupling said transmitter or receiver to said antenna, said network having a plurality of reactive elements adapted to be switched into or out of said network, the apparatus comprising:

a hollow conductive tube having a plurality of spaced, helically wound sections, each wound section corresponding to one of said reactive elements of said plurality, said tube having a plurality of openings therein;

a voltage supply means for providing first and second D.C. voltage levels on first and second insulated conductors, said first and second conductors being located within said conductive tube and being accessible through said openings in said tube;

each one of said plurality of wound sections having associated therewith a corresponding switching circuit, each switching circuit comprising:

a pair of PIN diodes connected in series and oppositely poled across the corresponding wound section;

a first biasing means for coupling one said D.C. voltage levels from within said tube through an opening to the junction between the series connected PIN diodes for reverse biasing said PIN diodes and thereby placing a relatively large impedance across said corresponding wound section;

a second biasing means for selectively coupling the other of said D.C. voltage levels from within said tube through an opening to said junction between the series connected diodes for selectively forward biasing said PIN diodes thereby selectively placing a relatively low impendece across said corresponding wound section;

said second biasing means including a light responsive element whereby said second biasing means couples said other D.C. voltage level upon the application of light energy to said light responsive element;

means for selectively generating light energy; and

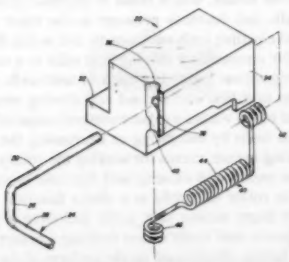
means for coupling said selectively generated light energy to individual ones of said light responsive elements in said plurality of switching circuits for selectively switching individual ones of said plurality of reactive elements corresponding to said wound sections into and out of said impedance matching network.

4,477,818

DEPLOYMENT MECHANISM FOR AN ELECTRONIC ARRAY

David L. Malvick, Newbury Park, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 16, 1982, Ser. No. 419,364
Int. Cl.³ H01Q 1/34, 1/08
U.S. Cl. 343—881 **8 Claims**



1. A deployment mechanism for a circular electronic array having a plurality of staves comprising:

an upper arm pivotably attached at one end to the side of a central unit and at the other end to the upper portion of one of said staves;

a plurality of hinge supports secured to the bottom of said central unit;

a lower arm pivotably attached at one end to one of said hinge supports and at the other end to the lower portion of one of said staves; and

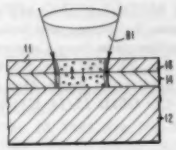
spring means interacting between said lower arm and said hinge support for both automatically rotating said lower arm from a stowed position to a deployed position and for translating said lower arm so that said stave is locked in said deployed position.

4,477,819

OPTICAL RECORDING MEDIUM

Michael H. Lee, San Jose; Aare Onton, and Harold Wieder, both of Saratoga, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 14, 1982, Ser. No. 388,319
Int. Cl.³ G01D 15/34
U.S. Cl. 346—76 L **6 Claims**



2. An optical storage medium having a predetermined surface profile including a substrate carrying a first and a second discrete layer of different materials which, upon marking with an energy beam, endothermically form a marked area having optical properties different from the optical properties of the unmarked areas, the improvement comprising:

said first layer consisting of a metal;

said second layer consisting of a metal or a semiconductor; and

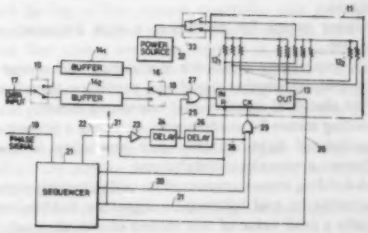
said medium, after marking with said energy beam to form an alloy or mixture, having a surface profile substantially the same as said predetermined surface profile.

4,477,820

METHOD OF DRIVING A THERMAL HEAD

Haruhiko Moriguchi, and Toshiharu Inui, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1982, Ser. No. 440,061
Claims priority, application Japan, Nov. 6, 1981, 56-177132
Int. Cl.³ G01D 15/10
U.S. Cl. 346—76 PH **5 Claims**



1. A method of driving a thermal head in which serial picture data to be recorded on one line is inputted to a shift register which produces parallel picture data corresponding to said input series picture data to drive heating elements of a thermal head by said parallel picture data, said method comprising the

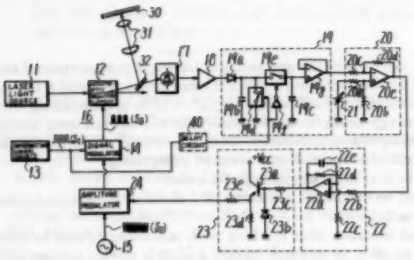
steps of; inputting serial picture data into said shift register together with a distinguishment data element added in front of said serial picture data, determining a time frame when a predetermined amount of picture data to be simultaneously recorded have been inputted to said shift register on the basis of timing when said distinguishment data is produced from an output terminal through which said serial picture data is outputted and, driving said thermal head while inhibiting the further input of serial picture data into said shift register during said time frame.

4,477,821

LIGHT MODULATING APPARATUS

Masanobu Yamamoto, Yokohama, and Nobuhiko Umezu, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 428,070
Claims priority, application Japan, Oct. 8, 1981, 56-160711
Int. Cl.³ G01D *15/14*; G11B *7/00*
U.S. Cl. 346—108 **20 Claims**



1. A light modulating apparatus for use with a recording means for recording an information signal on a recording medium comprising:

Acousto-optic modulating means including transducer means for providing an acoustic signal in response to a first electrical signal and light diffracting means for modulating said light emission in response to said acoustic signal so as to provide a modulated light emission for acting on said medium;

an information signal source for providing an information signal;

oscillator means for producing a high frequency carrier signal;

signal modulating means for modulating said carrier signal by said information signal and providing therefrom said first electrical signal to said transducer means;

detecting means for continuously detecting a portion of said modulated light emission and producing in response thereto a second electrical signal;

peak-holding means connected to said detecting means and actuable by said information signal for holding substantially a peak value of said second electrical signal;

comparator means for comparing said peak value of said second electrical signal with a reference signal and providing a corresponding error signal; and

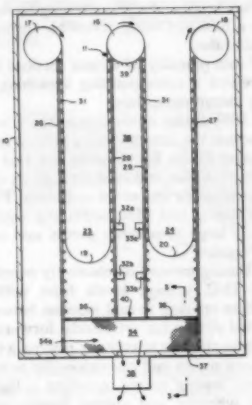
amplitude modulating means for controlling the amplitude of said high frequency carrier signal in accordance with said error signal.

4,477,822

GRAPHIC RECORDER

Thomas Luoma, Lafayette, and Alan Rutherford, Concord, both of Calif., assignors to Nicolet Zeta, Concord, Calif.

Continuation of Ser. No. 192,820, Oct. 1, 1980, abandoned. This application Aug. 20, 1982, Ser. No. 409,890
Int. Cl.³ G01D *15/28*
U.S. Cl. 346—136 **3 Claims**

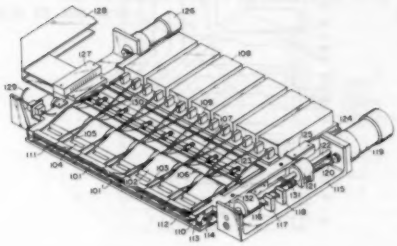


1. A graphic recorder for providing visually perceptible information on a web of flexible wide sheet material comprising: a pair of rolls with flexible wide material wrapped thereon and extending therebetween; drum means intermediate said pair of rolls having said sheet material partially wrapped thereon for moving said sheet material in at least one longitudinal direction from one roll to the other; a pair of wells for accommodating respective loops of said sheet material formed between each roll and said drum means; drive means connected to said drum means for controllably rotating said drum means to move said sheet material; head means juxtaposed with said drum means and movable in a transverse direction coincident with the rotary axis of said drum means for graphically recording on said sheet material; vacuum means connected to both said wells for maintaining a vacuum tending to pull said loops into said wells; means for cross-coupling the ambient vacuums in both said wells and responsive to a sudden movement of said drum means, which tends to increase pressure in one of said wells and decrease pressure in the other of said wells, to tend to equalize such vacuums in said wells; first and second means for controllably driving said rolls in a common direction; sensing means located in each of said wells electrically coupled to said first and second roll driving means for maintaining said loops within a predetermined range of movement within said wells by increasing or decreasing the speeds of said roll driving means; means for sensing the rotary velocity of said drum means and causing said first and second roll driving means to rotate said rolls as a direct function of said velocity of said drum means; said wells including a pair of inner panels adjacent said drum means forming a center chamber, said panels having ribs formed on the surfaces of the panels adapted to be engaged by the sheet material, said vacuum means including a vacuum chamber connected to said center chamber and vacuum pump means connected to said vacuum chamber, said means for cross-coupling the wells including lateral passages at the bottom of said wells adjacent said vacuum chamber.

4,477,823
INK JET RECORDING APPARATUS

Yohji Matsufuji; Shigeo Togano, and Hiroo Ichihashi, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 330,017
Claims priority, application Japan, Dec. 27, 1980, 55-188867; Dec. 27, 1980, 55-188868; Dec. 27, 1980, 55-188869; Dec. 27, 1980, 55-188870; Dec. 27, 1980, 55-188871
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R 9 Claims

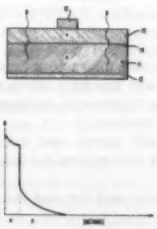


1. Ink jet recording apparatus of the full line type which comprises: a plurality of ink jet head units each comprising:
- a multi-array orifice ink jet head for effecting recording at a predetermined position;
- semiconductor means for driving said ink jet head to project a liquid droplet on demand from each orifice; and
- multi-layered wiring means for supplying electric signals to said semiconductor means;
- a plurality of reservoirs for storing ink to be fed to said ink jet heads, each said reservoir being for feeding ink to a respective one of said ink jet head units; and
- a common supporting member for supporting said ink jet head units and said reservoirs, said ink jet head units and reservoirs each being disposed on said common supporting member so that the relative position between them is maintained during operation of said apparatus.

4,477,824
LIGHT EMITTING DEVICE FOR OPTICAL SWITCHING

Bulusu V. Dutt, Parsippany, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 4, 1982, Ser. No. 354,773
Int. Cl.³ H01L *33/00*
U.S. Cl. 357—17 7 Claims

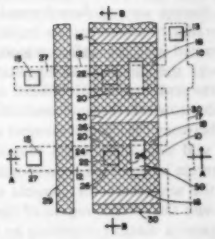


1. A semiconductor light emitting device comprising:
- a first region comprising a mixed crystal III–V semiconductor having a first conductivity type and a graded bandgap; and
- a second region comprising a mixed crystal III–V semiconductor having an opposite conductivity type adjacent to said first region thereby forming a heterojunction between the two regions with the bandgap of the first region continuously decreasing in a direction away from the junction and the second region having a significantly wider bandgap and a lower dopant impurity concentration at the junction than the first region.

4,477,825
ELECTRICALLY PROGRAMMABLE AND ERASABLE MEMORY CELL

Giora Yaron; Ying K. Shum; Ury Priel, all of Cupertino; Jayasimha S. Prasad, Sunnyvale, and Mark S. Ebel, Santa Clara, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 28, 1981, Ser. No. 334,700
Int. Cl.³ H01L *29/78, 27/02, 29/06, 29/04*
U.S. Cl. 357—23.5 10 Claims



1. A floating gate storage device for use with an electrically programmable and electrically erasable memory cell comprising:
- a semiconductor substrate of one conductivity type;
- first source and drain surface regions of the opposite conductivity type on said substrate;
- a first channel region connecting said first source and drain surface regions;
- a conductive floating gate insulated from all of the regions and having a first portion overlying said first channel region and a second portion overlapping at least one of said first source and drain regions in an overlap region wherein the first portion of the floating gate is connected to the second portion of the floating gate by separated dual paths disposed on opposite sides of the first channel region;
- a tunnel region inside said overlap region having borders which are interior to and displaced from the borders of said overlap region;
- a condutive control gate overlapping and insulated from said floating gate;
- second source and drain surface regions of the opposite conductivity type on said substrate;
- a second channel region connecting said second source and drain surface regions; and
- select gate means overlaying and insulated from said second channel region.

4,477,826

ARRANGEMENT FOR ALIGNING AND ATTACHING A SHIM TO A SEMICONDUCTOR ELEMENT

Nicholas R. Oley, Chippenham, England, assignor to Westinghouse Brake & Signal Co. Ltd., England

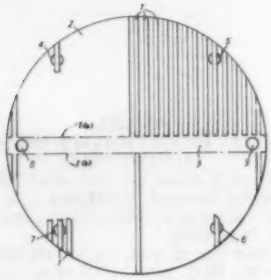
PCT No. PCT/GB80/00113, § 371 Date Mar. 4, 1981, § 102(e) Date Feb. 24, 198., PCT Pub. No. WO81/00172, PCT Pub. Date Jan. 22, 1981

PCT Filed Jul. 3, 1980, Ser. No. 243,904

Claims priority, application United Kingdom, Jul. 4, 1979, 7923223

Int. Cl.³ H01L *23/48, 29/40, 23/42*

U.S. Cl. 357—68 **7 Claims**



1. A semiconductor device assembly comprising a semiconductor element having an end face formed with a surface region and a plurality of alignment marks, an electrode to be electrically connected with the surface region, a contact member connected with the electrode and positioned adjacent to the end face of the semiconductor element, means for urging the contact member towards the semiconductor element, and a shim interposed between the contact member and the semiconductor element, said shim including a plurality of alignment means formed therein in positions corresponding to the alignment marks on the semiconductor element so that the shim may be aligned with the surface region of the semiconductor element, said alignment means comprising an aperture formed in the shim and a land extending at least partly across the aperture, and attachment means applied to the lands in the aperture for attaching the shim to the semiconductor element.

4,477,827

LEAD FRAME FOR LEADED SEMICONDUCTOR CHIP CARRIERS

John C. Walker, Kanata, and Manfred Thumm, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 230,758, Feb. 2, 1981, abandoned. This application Aug. 26, 1983, Ser. No. 526,600

Int. Cl.³ H01L *23/48, 29/44, 23/28*

U.S. Cl. 357—70 **11 Claims**

1. A lead frame for leaded semiconductor chip carriers, said lead frame comprising:

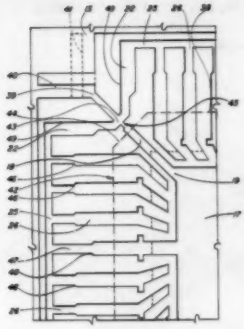
two parallel spaced apart side members;

a plurality of parallel transverse members extending between and normal to the side members and connected thereto to define a plurality of areas spaced along the lead frame;

a rectangular chip pad positioned centrally in each area, the chip pad having sides parallel to the side members and the transverse members;

a support lead extending from each corner of the chip pad to a junction of a side member and a transverse member, each of the junctions including a cantilever arm extending from one of said side members and said transverse members, substantially normal thereto, each cantilever arm having an inner free end, each support lead being connected at an outer end to an inner free end of an arm;

a U-shaped support bar extending between each adjacent pair of support leads, the support bar including spaced parallel leg portions each connected at an outer end by a lead support portion, the lead support portions being



parallel to related side and transverse members, the leg portions each being connected at an inner end to a support lead at a position intermediate the ends of the support leads; and

a plurality of leads extending from each lead support portion inwards towards the chip pad, the leads having inner ends adjacent to but spaced from the chip pad.

4,477,828

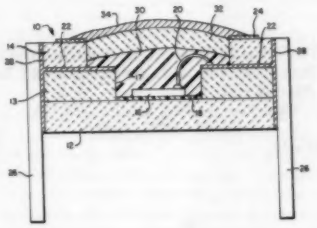
MICROCIRCUIT PACKAGE AND SEALING METHOD

Jeremy D. Scherer, Shore Acres Rd., South Dartmouth, Mass. 02748

Filed Oct. 12, 1982, Ser. No. 433,792

Int. Cl.³ A01L *39/02, 23/28, 23/30, 23/02*

U.S. Cl. 357—80 **10 Claims**



1. A hermetically sealed microcircuit comprising:

a microcircuit package having a cavity for receiving a microcircuit, and a continuous perimeter sealing surface surrounding said cavity;

a microcircuit in said cavity, said microcircuit having a plurality of circuit connections extending from said package;

a three layer hermetic seal for said microcircuit, said seal comprising

a first layer of a first material encapsulating said microcircuit, said first layer having an irregular outer boundary;

a second layer of a second material adhering to and covering said irregular outer boundary of said first layer, said second layer having an irregular outer boundary; and

a third layer of a third material adhering to and covering said irregular outer boundary of said second layer, said third layer having an irregular outer boundary, and said

third layer covering said continuous perimeter sealing surface and fused to said surface.

4,477,829

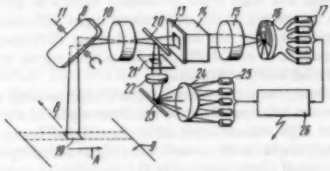
METHOD OF OBTAINING MULTIZONE IMAGES OF OBJECTS AND MULTIZONE SYSTEM THEREFOR

Yan L. Ziman; Vladimir A. Kottsov; Jury M. Chesnokov; Boris S. Dunaev; Alexei N. Drokhanov; Klavdia A. Kraush, and Stanislav D. Barabanov, all of Moscow, U.S.S.R., assignors to Institut Kosmicheskikh Issledovany Akademii Nauk SSSR, Moscow, U.S.S.R.

Filed Aug. 21, 1981, Ser. No. 295,133

Int. Cl.³ H04N *9/02, 7/18;* **G06K** *9/46, 9/76*

U.S. Cl. 358—1 **1 Claim**



1. A method of obtaining multizone images of objects comprising the steps of uninterruptedly optically scanning an object whose image is to be obtained and simultaneously forming a radiant flux from each portion of said object corresponding to an instantaneously scanned field of view, and forming the image of the object, converting said image of said object into an image of a spatial-frequency spectrum conveying information on spatial structure of the object, separating into zones said spatial frequency spectrum and detecting and measuring the varying intensity of radiant flux corresponding to the various zones and integrating the radiant flux in each zone in real-time, while converting the image of said object into a spatial-frequency spectrum dividing the first-mentioned radiant flux and converting the image of said object into an image of an electromagnetic spectrum, separating into zones said electromagnetic spectrum and detecting and measuring the varying spectral radiant intensity of radiant flux corresponding to the various last-mentioned zones and integrating the radiant flux in each last-mentioned zone in real time, developing thereby corresponding spatial and multispectral video signals synchronized with the scanning of said field of view, and coding the spatial video signals with different colors in accordance with the corresponding multispectral video signals so as to form a color representation of the spatial and multispectral content of the object.

4,477,830

PICTURE DISPLAY ARRANGEMENT

Nils T. Lindman; Lars H. Fransson, and Carl C. Pott, all of Järfälla, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 13, 1982, Ser. No. 434,082

Claims priority, application Sweden, Oct. 14, 1981, 8106091

Int. Cl.³ H04N *9/02*

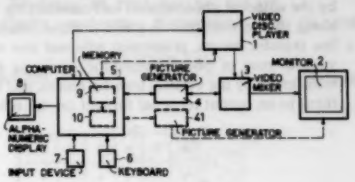
U.S. Cl. 358—1 **6 Claims**

1. An arrangement for the display of individually selectable map pictures as background information combined with overlay information comprising selectable predefined and/or operator generated symbols, characterized in that said arrangement comprise:

a video disc player with a video disc carrying said map pictures and having means for repeated playback of a selected map picture;

a computer having a memory storing map access information of each map picture and storing symbol generative data of said predefined symbols, and an operator input means for the selection of a map picture and a defined symbol;

a picture generator for transforming into a video signal the symbol generative data which is supplied from said memory;



a video mixer having video signal inputs which are connected to outputs of the video disc player and the picture generator and having mixing means for overlaying RGB-components of symbol video signals with priority onto RGB-components of map video signals such that the symbol picture non-transparently covers the map picture; and means for displaying the so combined video signal.

4,477,831

COLOR GAIN CONTROL CIRCUIT

Nobukazu Hosoya, Nara, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

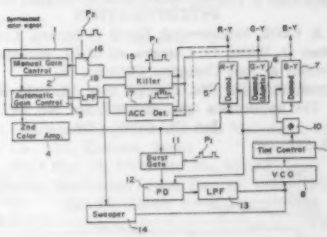
PCT No. PCT/JP81/00229, § 371 Date May 10, 1982, § 102(e) Date May 10, 1982, PCT Pub. No. WO82/01110, PCT Pub. Date Apr. 1, 1982

PCT Filed Sep. 10, 1981, Ser. No. 380,723

Claims priority, application Japan, Sep. 11, 1980, 55-127581

Int. Cl.³ H04N *9/535, 9/49*

U.S. Cl. 358—27 **4 Claims**



1. A color gain control circuit characterized in that a manual gain control, the bias of which is controllable by a manipulatable voltage, and an automatic gain control, the bias of which is automatically controllable by an ACC signal, are connected in cascade between a power source and a constant current source with the automatic gain control positioned upstream of the manual gain control with respect to the power source.

4,477,832

SOLID-STATE COLOR IMAGE PICKUP DEVICE N

Yasuo Takemura, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 20, 1982, Ser. No. 380,144

Claims priority, application Japan, Jun. 10, 1981, 56-88250

Int. Cl.³ H04N *9/07*

U.S. Cl. 358—44 **7 Claims**

1. A solid-state color image pickup device comprising:

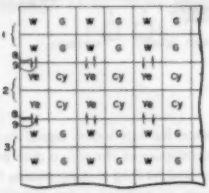
a semiconductor substrate;

a photosensor array formed on the substrate having a plural-

ity of photosensors arranged in horizontal rows and vertical rows, each photosensor generating a charge upon receipt of an image;

vertical transfer means, positioned adjacent each vertical row of photosensors, for receiving the charges generated by the adjacent photosensors and transferring the charges along the vertical row to a line transfer means;

a line transfer means, positioned adjacent one end of each vertical row of photosensors for receiving the charges transferred by the vertical transfer means, and transferring them to an output terminal formed on the substrate; and



a color filter array having a plurality of separate filter elements arranged in horizontal and vertical rows, comprising white (W), yellow (Ye), green (G) and cyan (Cy) filter elements, each of said elements corresponding to a respective photosensor;

said horizontal rows of filter elements comprising:

a first pair of identical horizontal rows comprising white elements; and

a second pair of identical horizontal rows, positioned adjacent the first pair, comprising yellow elements, wherein each of said white filter elements of the first pair is arranged in the same vertical row with a yellow filter element of the second pair.

4,477,833

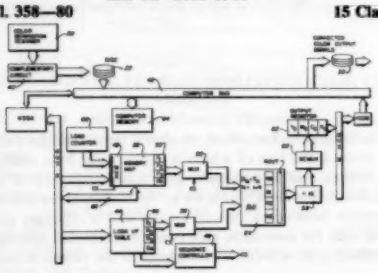
METHOD OF COLOR CONVERSION WITH IMPROVED INTERPOLATION

David A. Clark, Streamwood; David C. Strong, Lynwood, and Thomas Q. White, II, Chicago, all of Ill., assignors to R. R. Donnelley & Sons Company, Chicago, Ill.

Continuation of Ser. No. 292,293, Aug. 12, 1981, abandoned. This application Apr. 25, 1983, Ser. No. 489,151

Int. Cl.³ G03F *3/08*

U.S. Cl. 358—80 **15 Claims**



1. In the conversion of a color image from one color space to another color space including the steps of providing a three dimensional input signal representing the color of a pixel of said image in said one space and providing a memory with a finite number of three dimensional addresses representing colors in said one space, said memory having at each address output signals representing the corresponding color in said other space, an improved method of interpolating to determine the output signals for pixel color input signals between two memory addresses, comprising:

determining the base output signals for the base memory address next below said input signals;

determining the high, mid and low valued input signal components representing the difference between the pixel color input signal and the base memory address below the input signal;

determining additional signals for memory addresses next above said input signals in accordance with said high, mid and low valued input difference signal components;

interpolating between output signals for the memory addresses below and above the input signal in accordance with the low valued input difference signal component to establish a first output signal increment from said base output signals;

interpolating between output signals for the memory addresses below and above the input signal in the plane of the mid and high input difference signals in accordance with the excess of the mid valued input difference signal component over the low valued input difference signal component to establish a second output signal increment from said base output signals;

interpolating between output signals representing memory addresses below and above the input signal along the axis of the high valued input difference signal component in accordance with the excess of the high valued input difference signal component over the mid valued input difference signal components to establish a third output signal increment from said base output signals; and

summing the base output signals with said first, second and third output signal increments to generate output signals representing the color of said pixel in said other color space.

4,477,834

SCAN CONVERSION CIRCUIT

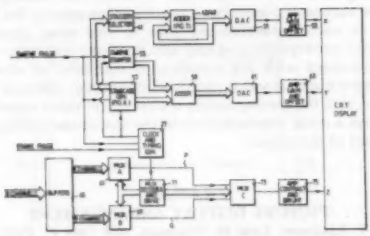
David A. Beaumont, and Michael A. King, both of Camberley, England, assignors to The Marconi Company Limited, United Kingdom

Filed May 21, 1982, Ser. No. 380,610

Claims priority, application United Kingdom, May 29, 1981, 8116450

Int. Cl.³ H04N *5/33*

U.S. Cl. 358—113 **8 Claims**



1. A scan conversion circuit for generating scanning signals for a cathode ray tube (C.R.T.) display from timing information and output signals generated by a two-dimensional array of detector elements scanned over a field of view in a serial parallel mode, said scan conversion circuit comprising:

(a) a timing generator for receiving timing information from said scanned array,

(b) a serial (X)-deflection circuit linked to said timing generator for supplying an X-deflection signal to said C.R.T. display,

(c) a parallel (Y)-deflection circuit linked to said timing generator for supplying a Y-deflection signal to said C.R.T. display, and

(d) means synchronized by said timing generator for supplying a brightness modulation signal to said C.R.T. display,

(I) wherein said serial (X)-deflection circuit comprises means for generating a repeating waveform,

(i) which waveform oscillates about a steadily increasing mean value, and

(II) said parallel (Y)-deflection circuit comprises means for generating a substantially triangular stepped waveform,

(i) having at least two periods per repeating unit of said repeating waveform for producing a scan pattern which is a high-speed trace of the pattern of said detector element array repeated a multiplicity of times within each serial scan of said array.

4,477,835

CHARGE TRANSFER PHOTOSENSITIVE DEVICE

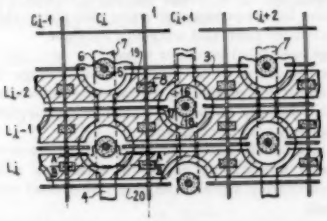
Jean L. Berger, and Pierrick Descure, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 9, 1982, Ser. No. 356,340

Claims priority, application France, Mar. 13, 1981, 81 05136

Int. Cl.³ H04N *3/15, 9/07*

U.S. Cl. 358—213 **24 Claims**



1. Charge transfer photosensitive device adapted to receive a light image and emitting electrical signals of analysis of this image, wherein said device comprises:

a plurality of elementary photosensitive zones, arranged on the same semi-conductor substrate on N lines and M columns, said zones being insulated from one another, in said zones electrical charges being created depending upon the light received, each of the elementary zones comprising a MOS capacitance forming a first zone for collecting the charges, comprising a single grid common to all capacitances of the same line, and a second zone for collecting the charges, electrically coupled to the capacitance;

connecting and controlling means, delivering parallel-wise the electrical charges created in the M photosensitive zones of the same line, and this successively for the N lines, said means comprising a plurality of reading diodes, arranged in columns between the elementary photosensitive zones, in order that each receives successively on order the charges of two elementary zones, belonging to two different lines;

means forming a charge screen, arranged between each photosensitive zone and the connecting means, said screen means presenting a plurality of grids, brought to a constant voltage and arranged in columns between reading diodes and the photosensitive zones;

a memory of M points, called line memory, successively receiving the charges accumulated by each line, from connecting and controlling means;

a shift register, receiving parallel-wise the contents of the line memory and delivering successively an electrical signal forming the image analysis signal.

4,477,836

SYSTEM FOR CONVERTING IMAGE INFORMATION INTO ELECTRICAL SIGNALS

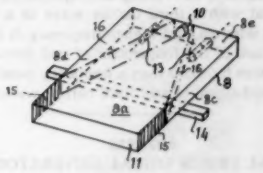
Marinus J. P. Vetjens, Helmond, Netherlands, assignor to Océ-Nederland B.V., Venlo, Netherlands

Filed Aug. 18, 1982, Ser. No. 409,318

Claims priority, application Netherlands, Aug. 24, 1981, 8103918

Int. Cl.³ H04N *1/12*

U.S. Cl. 358—293 **15 Claims**



1. In a system for converting information on an original into electrical signals, comprising means for scanning the original linewise by a light beam focussed to a spot directed onto and moved along a line on the original, detector means for detecting and for issuing electrical signals in response to light of said beam reflected by the original and means for transmitting such reflected light to said detector means, said light transmitting means including a transparent entry surface extending longitudinally of a said line to be scanned by said beam, two confronting, parallel specular surfaces which extend from the entry surface to the detector means and are substantially parallel to said line, and two side surfaces which border laterally the region bounded by the entry surface, said parallel specular surfaces and the detector means, the improvement which comprises that said side surfaces in the vicinity of said entry surface are substantially perpendicular to a line connecting the ends of said line to be scanned and are made specular at least near said entry surface.

4,477,837

VIDEO SIGNAL RECORDING-REPRODUCING APPARATUS

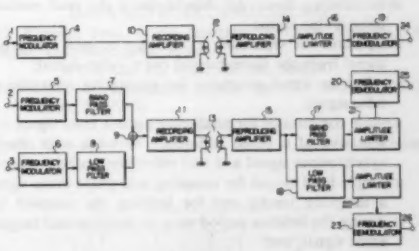
Seigo Asada, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 16, 1981, Ser. No. 331,276

Claims priority, application Japan, Dec. 19, 1980, 55-180683

Int. Cl.³ H04N *9/491*

U.S. Cl. 358—310 **4 Claims**



1. An image recording-reproducing apparatus comprising:

means for modulating a first carrier wave of a first frequency f_Q by a chrominance signal component Q to produce a first modulated signal;

means for modulating a second carrier wave of a second frequency f_I by a chrominance signal component I to

produce a second modulated signal, said second frequency f_I being higher than said first frequency f_Q;

said first and second modulated signals forming part of an image signal;

means for superimposing said first and second modulated signals on one another;

first means for recording said superimposed first and second modulated signals on a recording medium;

means for reproducing recorded first and second modulated signals;

means for frequency converting said reproduced first modulated signal with a third carrier wave of a higher frequency f_3 wherein said higher frequency f_3 is separated from the sum of the frequencies of said first and second carrier waves by more than a frequency band width of a demodulated signal of said third carrier wave.

4,477,838

TANGENTIAL ERROR SIGNAL GENERATOR IN PAL TYPE VIDEO DISC PLAYER

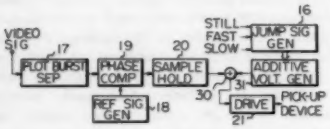
Toru Akiyama, Tokorozawa, Japan, assignor to Universal Pioneer Corporation, Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,880

Claims priority, application Japan, Dec. 18, 1980, 55-182298[U]

Int. Cl.³ H04N 9/44

U.S. Cl. 358—322 **6 Claims**



1. A video disc player in which a video disc of PAL type is rotated in the vicinity of a pick-up device which reads a modulated color video signal from a target track on said video disc by means of an information reading spot, which comprises:

tracking servo means for controlling the position of said information reading spot with respect to said target track in accordance with a tracking error signal and a tangential error signal;

jump control means for controlling jumping operation by applying a jump command signal to said tracking servo means thereby to cause said information reading spot to jump from one target track to a required track in order to change the reading sequence of said modulated color video signal;

demodulating means for demodulating the read modulated color video signal;

a separator for separating a time-base control synchronous signal from the demodulated color video signal;

a reference signal generator for generating reference periodic signal;

a phase comparator for producing a phase error signal representative of a phase difference between said time-base synchronous signal and said reference periodic signal;

a sample hold circuit for sampling said phase error signal at a sampling timing and for holding the sampled value during the holding period so as to produce said tangential error signal; and

a phase correction means for correcting the phase of the demodulated color video signal in accordance with a position of said required track with respect to the position of said information reading spot, wherein said phase correction means is adapted to shift the level of said tangential error signal in accordance with the position of said required track.

4,477,839

COLOR VIDEO SIGNAL REPRODUCING APPARATUS

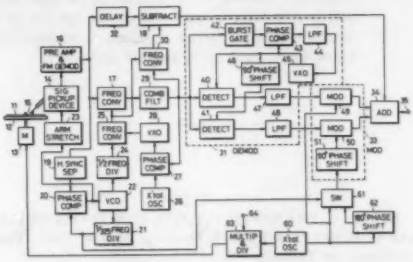
Hiroyuki Sugiyama, Isehara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 22, 1982, Ser. No. 341,637

Claims priority, application Japan, Jan. 26, 1981, 56-9921

Int. Cl.³ H04N 5/76

U.S. Cl. 358—326 **6 Claims**



1. A color video signal reproducing apparatus comprising:

reproducing means having a jitter compensation mechanism for reproducing a color video signal from a recording medium;

frequency converter means responsive to said reproducing means for frequency-converting the color video signal reproduced from said recording medium;

voltage controlled oscillator means;

means responsive to an output of said voltage controlled oscillator for producing a frequency converting signal, said frequency converting signal being supplied to said frequency converter means;

horizontal synchronizing signal separation means responsive to said reproducing means for separating a horizontal synchronizing signal from said reproduced color video signal;

phase comparing means jointly responsive to said horizontal synchronizing signal separation means and to said voltage controlled oscillator means for comparing the phases of said separated horizontal synchronizing signal and the output of said voltage controlled oscillator, said phase comparing means having an output phase error signal which is supplied to said voltage controlled oscillator to control the oscillation frequency thereof, and said output phase error signal being supplied to said jitter compensation mechanism to cause it to perform a jitter compensation;

carrier chrominance signal separation means responsive to said frequency converter means for separating a carrier chrominance signal from said reproduced color video signal;

luminance signal separation means responsive to said reproducing means for separating a luminance signal from said reproduced color video signal;

demodulating circuit means responsive to said carrier chrominance signal separation means for demodulating said color video signal to provide two color difference signals, said demodulating circuit means including an oscillator for supplying a frequency signal to a demodulating means, and a control circuit means for controlling the oscillation frequency of said oscillator in response to a jitter component in said carrier chrominance signal;

reference signal producing means for producing a reference signal having a predetermined frequency;

phase shifting circuit means for shifting the phase of a signal from said reference signal producing means by 180 degrees;

switching circuit means for switching the signals from said reference signal producing means and said phase shifting

circuit means in response to every one horizontal scanning period in the output of the voltage controlled oscillator;

modulating circuit means responsive to said reference signal producing means and said switching circuit means for respectively modulating the reference signal and the signal from said switching circuit means by the color difference signals obtained from said demodulating circuit means; and

color video signal obtaining means responsive to said modulating circuit means and to said luminance signal separating means for obtaining a color video signal by adding the output of said modulating circuit and said separated luminance signal.

4,477,840

VIDEO RECORDER

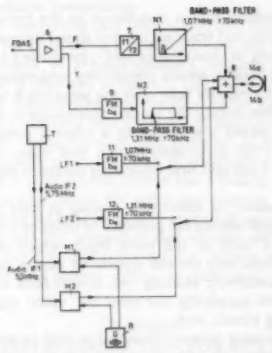
Hans-Jürgen Kluth, Garbsen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 6, 1982, Ser. No. 366,083

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1981, 3113862; May 30, 1981, 3121600

Int. Cl.³ H04N 9/493, 7/04

U.S. Cl. 358—330 **18 Claims**



1. In a video tape recorder for recording a television signal composed of a picture carrier which has been frequency modulated with a video luminance signal, a chrominance subcarrier which has been modulated with a chrominance signal, and a plurality of frequency separated audio carrier signals each composed of an audio carrier which has been frequency modulated with a respective audio signal along a recording track, and for playing such a signal, the improvement comprising a recorder portion including means for reducing the audio carrier signals in frequency by difference formation of the television signal audio carrier signals with a stabilized reference frequency signal, and for recording the reduced frequency audio carrier signals with their original frequency separation in a frequency band located, in the recorded signal, essentially between the frequency spectrum of the modulated chrominance subcarrier and a location in the frequency spectrum of the modulated picture carrier, and a playback portion including means for returning the reduced frequency audio carrier signals to their original frequency levels by sum formation with the reference frequency signal.

4,477,841

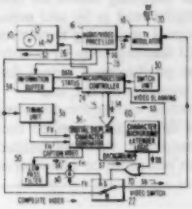
VIDEO PLAYER WITH CAPTION GENERATOR HAVING CHARACTER BACKGROUND PROVISIONS

Thomas Y. Chen, East Brunswick, and Walter G. Gibson, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 6, 1981, Ser. No. 309,192

Int. Cl.³ H04N 5/76

U.S. Cl. 358—335 **9 Claims**



1. A video player for providing an RF output signal for reception by a television receiver, comprising:

signal recovery means for providing a composite video signal of a given bandwidth;

character generator means for providing caption video signal having a bandwidth greater than said given bandwidth and a caption background signal;

low pass filter means coupled to said generator means for limiting the bandwidth of said caption video signal to a predetermined value, said filter means having a characteristic delay;

circuit means coupled to said generator means for extending said background signal for a predetermined time subsequent to each occurence thereof, said predetermined time corresponding to a multiple of said characteristic delay;

switch means responsive to the extended background signal for combining the composite video signal with the bandwidth limited caption video signal in interleaved fashion to form a resultant signal;

RF modulator means responsive to said resultant signal for providing a modulated radio frequency output signal on a selected television channel; and

said bandwidth of said low pass filter means and the value of said predetermined time of said circuit means being selected so as to reduce visibility of cross color effects and effectively center the caption and background signals when captions are viewed on said television receiver.

4,477,842

DATA REPRODUCING CIRCUIT

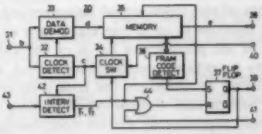
Kenji Kaneko, Iwai, Japan, assignor to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed Apr. 15, 1982, Ser. No. 368,247

Claims priority, application Japan, Apr. 20, 1981, 56-59437; Apr. 30, 1981, 56-65810

Int. Cl.³ H04N 5/76

U.S. Cl. 358—336 **7 Claims**



1. A data reproducing circuit comprising:

modulated data signal supplying means for supplying a modulated data signal including a framing code representing a series of data signals;

clock signal detecting and reproducing means supplied with said demodulated data signal, for detecting and reproducing a clock signal;

data signal demodulating means supplied with said modulated data signal, for demodulating said data signal;

memory means for reading in and reading out a data signal demodulated by said data signal demodulating means;

framing code detecting means for detecting a framing code within a signal read in by said memory means;

instruction signal producing means responsive to the detection of said framing code by said framing code detecting means, for producing a signal for instructing read-out from said memory means; and

dropout detecting means for detecting dropout within said modulated data signal supplied thereto and producing a detected output, so that said instruction signal producing means does not produce said instruction signal.

4,477,843

SYSTEM FOR STILL OR SLOW-MOTION REPRODUCTION OF TELEVISION PICTURES

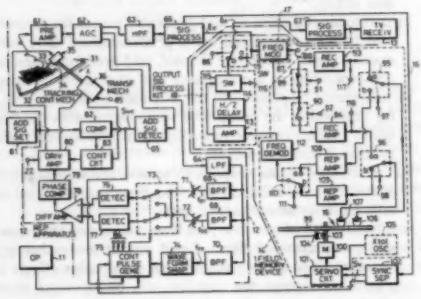
Hisao Kinjo, and Kazuo Tatsuguchi, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 88,333, Oct. 26, 1979, abandoned. This application Dec. 2, 1981, Ser. No. 326,700

Claims priority, application Japan, Oct. 27, 1978, 53-132273

Int. Cl.³ H04N *5/76, 5/78*

U.S. Cl. 358—342 **9 Claims**



1. A system for reproducing still or slow-motion television pictures responsive to reproduced signals from a rotary recording medium, said rotary recording medium having a video signal recorded on a spiral main track with first and second reference signals recorded on a subtrack, said subtrack being formed between successive track turns of the main track and having only one of the first and second reference signals recorded on a per one track turn basis, the first and second reference signals being interchanged with each other on each successive track turn, a third reference signal being recorded at a position where the first and second reference signals interchange the sides of the main track on which they are recorded, a plurality of fields of the video signal being recorded on the rotary recording medium in each one track turn of the main track, each field of the plurality of fields of the video signal being preceded by a vertical synchronizing signal, said third reference signal being recorded on the rotary recording medium along with one of said vertical synchronizing signals in each track turn, said reproducing system comprising:

operating part means comprising a plurality of control buttons for selecting a desired mode of operation, the mode of operation including at least a normal reproduction mode and a special reproduction mode, said normal reproduction mode being a mode in which the recorded signals are reproduced from the rotary recording medium at a rate of picture motion which is the same as the rate at which the signals were originally recorded, said special reproduction mode being a mode in which the recorded signals are reproduced from the rotary recording medium at a rate of picture motion which is different from the rate at which the signals were originally recorded, said operating part means producing a predetermined mode selection signal in response to a manipulation of a predetermined control button among said plurality of control buttons;

reproducing means including a reproducing element for scanning over the tracks on the rotary recording medium to pick up the recorded signals;

first separating means for separating the first through third reference signals from signals which are reproduced by said reproducing means, and for separately producing the first through third reference signals and the video signals within the reproduced signals;

second separating means for separating the vertical synchronizing signal from the video signal which is produced from said first separating means;

control pulse generating means for generating a plurality of control pulses in response to the mode selection signal from said operating part means, the third reference signal which is separated in said first separating means, and the vertical synchronizing signal which is separated in said second separating means;

tracking control signal forming means for forming a tracking control signal in response to the first and second reference signals which are separated in said first separating means and a control pulse from said control pulse generating means;

tracking control means responsive to the tracking control signal from said tracking control signal forming means for controlling the tracking of said reproducing element, said tracking control means controlling said reproducing element to repeatedly scan over the same track turn a plurality of times during the special reproduction mode;

switching means responsive to a control pulse from said control pulse generating means, said video signal being supplied from said first separating means to said switching means;

memory means for selectively storing at least one field of video signal among the plurality of fields of video signal in one track turn of the main track which are supplied thereto from said second separating means, said memory means selectively reading one stored field of the video signal and supplying the read out video signal to said switching means; and

signal processing means connected to said switching means for processing the video signal read out from said memory means to produce a television signal for driving a television receiver,

said control pulse generating means enabling said switching means to pass the video signal from said first separating means to said signal processing means in the normal reproduction mode, and generating a control pulse which causes said switching means to pass the read-out signal from said memory means in response to a special reproduction mode selection signal,

said memory means comprising a memory control part, a memory part, and a signal processing part,

said control pulse generating means generating control pulses which cause said memory control part to selectively supply at least one field of video signal in one track turn of the main track to said memory part for storage,

said control pulse generating means generating control pulses which cause said memory control part to selectively read out one stored field of the video signal from the memory part in response to the special reproduction mode selection signal from said operating part, said control pulses which cause said selective read-out from said memory part being generated only after said control pulse

generating means receives the third reference signal from said first separating means after having received the special reproduction mode selection signal,

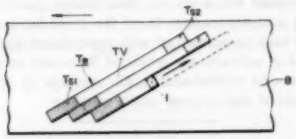
said signal processing part processing said one field of the video signal read out from said memory part into a processed video signal in which two interlaced fields are made up from the same one field of the video signal, and supplying the processed video signal to said switching means.

4,477,844

APPARATUS FOR RECORDING A DIGITAL AUDIO SIGNAL IN A TRACK WITH A VIDEO SIGNAL

Kenji Nakano, Ebina; Yukihiko Machida, Seki, and Kentaro Odaka, Kawasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 5, 1982, Ser. No. 346,144
Claims priority, application Japan, Feb. 10, 1981, 56-18651
Int. Cl.³ H04N *5/782*
U.S. Cl. 360—8 **13 Claims**



1. Apparatus for recording an information signal comprised of a video signal and an audio signal in a plurality of tracks on a record medium, comprising:

means for converting said audio signal into digital form, said means for converting including means for sampling said audio signal at a predetermined frequency to produce successive digitized samples of said audio signal;

means for compressing said digitized audio signal; and

means for recording said compressed digitized audio signal and said video signal in said plurality of tracks, each of said plurality of tracks being divided into a leading track section, a central track section and a trailing track section, wherein said means for recording records alternate said samples of said digitized audio signal in said leading track section and the remaining said samples of said digitized audio signal in said trailing track section and said video signal in said central section of each track.

4,477,845

DYNAMIC SKEW CORRECTION FOR MULTICHANNEL ANALOG RECORDING

Clarence E. Mortlock, Media; Joseph A. Brady, Norristown, and Marvin Shapiro, Warminster, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

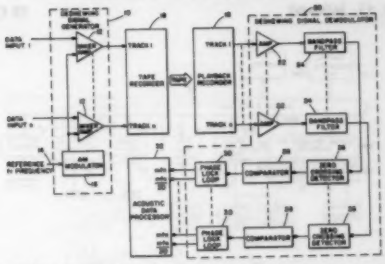
Filed Feb. 22, 1982, Ser. No. 350,899
Int. Cl.³ G11B *5/43, 5/02*
U.S. Cl. 360—26 **6 Claims**

1. A apparatus for dynamic skew correction of multi-channel analog recorded and played back information comprising:

means for generating a carrier frequency signal amplitude modulated by a lower frequency modulation signal having predetermined characterists comprising predetermined frequency and phase relationships with the carrier signals and the modulation signals being derived from a common source and are frequency and phase related, the predetermined frequency and phase relationships permitting predetermination of the time relationship of zero crossing points of the derived individual lower frequency modulation signals,

means for recording the amplitude modulated carrier signal on at least two of a plurality of channels simultaneously with the recording on the respective channels of the analog information,

means for deriving the recorded amplitude modulated carrier signals and the lower frequency modulation signals from the plurality of channels simultaneously with the respective played back analog information,



means for comparing the predetermined characteristics of the derived signals for determing skew errors, and

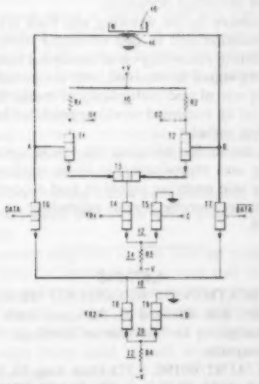
means for time displacing the played back information for correcting skew errors between the various channels.

4,477,846

SENSITIVE AMPLIFIER HAVING A HIGH VOLTAGE SWITCH

Peter E. Cottrell, Essex Junction; John E. Gersbach, and Wilbur D. Pricer, both of Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,403
Int. Cl.³ G11B *5/09, 5/02*
U.S. Cl. 360—46 **13 Claims**



1. An amplifier comprising;

first and second transistors, each including a base, collector and emitter,

a device having first and second PN junctions serially arranged and connected between the emitters of said first and second transistors,

means including a current source for selectively providing a bias action to said device at a common point between said first and second junctions,

means for applying complementary input signals to the bases of said first and second transistors, and

load means including output terminals connected to the collectors of said first and second transistors.

4,477,847

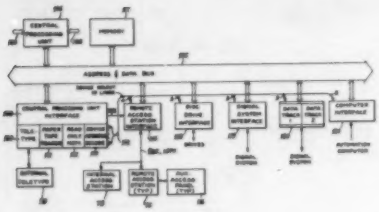
TELEVISION SIGNAL DISC DRIVE RECORDER

Howard W. Knight, 600 Matsonia Dr., Foster City, Calif. 94404, and Edwin W. Engberg, 80 Dartmouth, San Carlos, Calif. 94070

Continuation of Ser. No. 763,795, Jan. 28, 1977,. This application Jun. 14, 1979, Ser. No. 48,357

Int. Cl.³ G11B *15/04;* **H04N** *5/78*

U.S. Cl. 360—60 **18 Claims**



1. In a disc drive magnetic recording and reproducing apparatus having removable rotatable disc means and wherein said disc means have a multiplicity of separate tracks upon which recording and reproducing can be performed, apparatus for conditionally permitting selected recording operations to thereby minimize the probability of unwanted destruction of recorded information by an operator, said apparatus comprising:

means independent of said disc means for storing track address information, bulk and working track address identification information, and status information indicating whether information is recorded on each of said tracks;

means associated with said storing means for classifying one plurality of said multiplicity of tracks as bulk tracks and another plurality of said multiplicity of tracks as working tracks;

means associated with said storing means for identifying tracks which have information recorded thereon and which are therefore occupied;

means responsive to the working and bulk track identification information and to said recorded status information for prohibiting recording on an occupied bulk track unless an enabling signal is received, and for permitting recording on any one of said multiplicity of tracks that is unoccupied and on an occupied working track without receiving an enabling signal;

controlling means for selecting the tracks upon which said recording and reproducing is to be performed and for providing said enabling signal to said recording prohibiting means to thereby permit recording on an occupied bulk track.

4,477,848

VERIFICATION OF RECORDED MESSAGES

Ian McWhirter, and Richard B. Morgan, both of Hornsby, Australia, assignors to McWhirter Holdings Pty. Limited, Hornsby, Australia

PCT No. PCT/AU81/00190, § 371 Date Aug. 10, 1982, § 102(e) Date Aug. 10, 1982, PCT Pub. No. WO82/02111, PCT Pub. Date Jun. 24, 1982

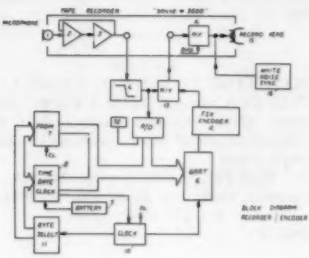
PCT Filed Dec. 16, 1981, Ser. No. 414,533

Claims priority, application Australia, Dec. 16, 1980, PE6962; Feb. 13, 1981, PE7608; Feb. 23, 1981, PE7711; Apr. 15, 1981, PE8458; May 27, 1981, PE9043; Jul. 10, 1981, PE9699; Aug. 18, 1981, PE0309

Int. Cl.³ G11B *15/04, 15/02, 5/43*

U.S. Cl. 360—60 **19 Claims**

1. A recording/reproduction system for recording in a recorder and on a record medium analogue signals representive of an original audio message and a first data stream, and for reproducing subsequently in a reproducer and from said record medium the signals representative of the audio message and the data stream, and effecting playback of the audio message and indicating whether said playback is an authentic representation of said original audio message, said system being characterised in that said first data stream is representative of the periodic instantaneous content of a parameter of said original audio message signals, a comparison is made between said



first data stream and a second data stream generated in said reproducer and representative of the periodic instantaneous content of said parameter of said reproduced audio mesage signals, and as indication is provided from said comparison as to whether said reproduced audio message is an authentic reproduction of said original audio message.

4,477,849

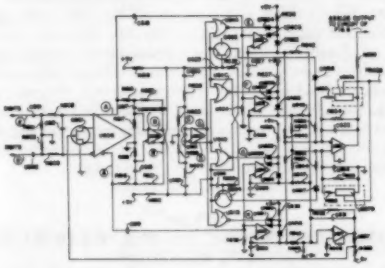
MAGNETIC DISC DRIVE HEAD ALIGNMENT SYSTEM

James K. Berger, Malibu, Calif., assignor to Pioneer Magnetics, Inc., Santa Monica, Calif.

Filed Apr. 12, 1982, Ser. No. 367,358

Int. Cl.³ G11B *5/58, 21/10*

U.S. Cl. 360—77 **6 Claims**



1. In a disc drive which includes a plurality of read/write magnetic heads and a servo magnetic head mounted for simultaneous movement by an actuator in response to a servo signal from the servo head, and in which the positions of the read/write heads are individually adjustable with respect to the servo head, a system for indicating any misalignment of the individual read/write heads as the particular head produces a cyclic position signal in response to position signals prerecorded on alignment tracks of an alignment disc, each cycle of said cyclic position signal having a first segment with positive and negative peak amplitudes and a second segment with positive and negative peak amplitudes, the positive and negative peak amplitudes of said first and second segments being equal when the particular head is in registry with the corresponding alignment track, and the positive and negative peak amplitudes of one or the other segments decreasing when the particular head moves out of registry with the alignment rack to one side or the other thereof; said system including balanced gating circuitry having four output circuits for respectively

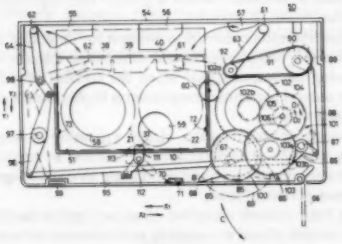
producing four gating signals respectively timed to occur in time coincidence with respective ones of the positive and negative peak amplitudes of said first and second segments; a balanced input circuit connected to the particular head and including first and second outputs respectively applying the cyclic position signal and its complement to said gating circuitry to cause said gating circuitry to cause said gating circuitry to produce said four gating signals at the respective output circuits thereof; peak detector circuitry including four peak detector circuits respectively connected to said four output circuits of said gating circuitry to be individually gated by respective ones of said four gating signals, means connecting two of said peak detector circuits to the first output of said balanced input circuit and further means connecting the other two of said peak detector circuits to the second output of said balanced input circuit, said four peak detector circuits collectively detecting the positive and negative peak amplitudes of each of the two segments of each cycle of said position signal and providing four analog outputs corresponding thereto; and output circuitry connected to the outputs of said four peak detector circuits in said peak detector circuitry for producing an analog output signal having an amplitude corresponding to the difference between the algebraic sum of the positive and negative peak amplitudes of the first segment and the algebraic sum of the positive and negative peak amplitudes of the second segment.

4,477,850

ADAPTER FOR A MINIATURE TYPE TAPE CASSETTE

Haruki Ogata, Sagamihara; Kimio Ogawa, and Hiroyuki Umeda, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 18, 1982, Ser. No. 340,105
Claims priority, application Japan, Jan. 20, 1981, 56-7566
Int. Cl.³ G11B *15/66*
U.S. Cl. 360--94 **12 Claims**



1. An adapter for a miniature type tape cassette having an external form and size smaller than those of a standard type tape cassette, said miniature type tape cassette being used with a recording and/or reproducing apparatus of a type different from a standard type recording and/or reproducing apparatus primarily designed for performing recording and/or reproduction with said standard type tape cassette, said adapter comprising:

an adapter case having an external form and size substantially equal to those of said standard type tape cassette;

an accommodating part for accommodating said miniature type tape cassette; and

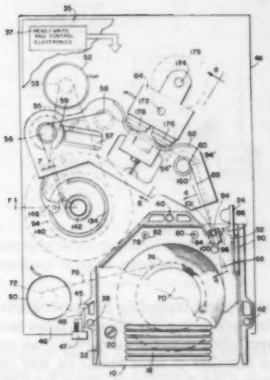
tape draw-out means provided within said adapter case, for drawing a tape out of said miniature type tape cassette so as to form a predetermined tape path within said adapter case.

4,477,851

MAGNETIC DATA STORAGE AND DRIVE APPARATUS

Warren L. Dalziel, Monte Sereno; Charles D. Flanigan, San Jose, and John J. Lynott, Los Gatos, all of Calif., assignors to Microtek Storage Corporation, San Jose, Calif.

Filed Jun. 7, 1982, Ser. No. 386,048
Int. Cl.³ G11B *5/008, 23/02;* G03B *1/56;* B65H *17/46*
U.S. Cl. 360—95 **10 Claims**



1. Data storage and drive apparatus comprising:

cartridge means containing a length of magnetic recording tape disposed upon a supply reel and having a ferrule means attached to the lead end of the tape, said cartridge means having first capture means for releaseably holding said ferrule means in a first position relative to said cartridge means; and

drive means including

second capture mean releaseably holding a pin means in a second position relative to said drive means,

magnetic read/write means,

guide means defining a tape path extending from a take-up position passed said read/write means to said second position,

take-up means disposed at said take-up position and having a strip of leader material one end of which is attached to said take-up means and the other end of which has a ferrule engaging pin means affixed thereto, said strip being threaded around said guide means with said pin means being held in said second position by said second capture means,

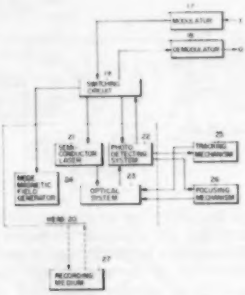
carrier means for receiving said cartridge means and carrying it between a cartridge load/unload position and a tape wind/unwind position wherein said first capture means is aligned with said second capture means such that said ferrule means is caused to engage said pin means as said carrier means is moved into said wind/unwind position thereby forming a slug means coupling said leader to said tape, and

control means for causing said take-up means to retract said strip and to take-up the tape attached thereto by said slug means by pulling it along said tape path, and for causing data to be read from or recorded on said tape as it is drawn passed said read/write means.

4,477,852
MAGNETO-OPTICAL RECORDING AND REPRODUCING SYSTEM

Chuichi Ota, Fuchu; Nobutake Imamura, Tokyo, and Shinsuke Tanaka, Kamakura, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 358,040
Claims priority, application Japan, Mar. 28, 1981, 56-45760
Int. Cl.³ G11B 5/32
U.S. Cl. 360—114 13 Claims



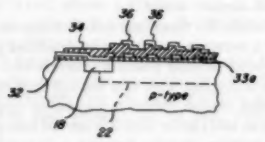
1. A magneto-optical recording and reproducing system for recording information on a recording medium made of a magneto-optical recording material comprising; an optical system for applying a plurality of light beams on said recording medium for radiating the recording medium with incident radiation at a plurality of irradiated positions;

drive means for driving the optical system and the recording medium relatively to each other for shifting positions on the recording medium irradiated by said light beams; mode magnetic field generating means disposed for generating coercive fields of different coercive values applied to said recording medium forwardly and rearwardly of some of said irradiated positions; photo-detecting means for detecting reflected light from said medium; control means for effectively controlling said optical system, said drive means, said mode magnetic field generating means and said photo-detecting means for effecting selectively recording-reproducing concurrently or reproducing-erasing concurrently or erasing-recording of said information of said recording medium.

4,477,853
MULTITRACK MAGNETIC HEAD

James U. Lemke, Del Mar, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 15, 1981, Ser. No. 254,249
Int. Cl.³ G11B 5/12
U.S. Cl. 360—125 16 Claims



1. An integrated magnetic head structure comprising

(a) a semiconductor substrate,

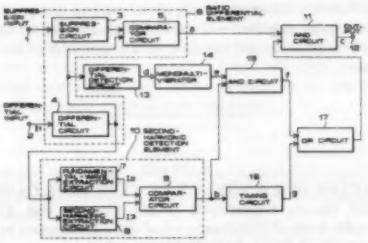
(b) a film of magnetic material deposited on said substrate for use in processing magnetic signals with respect to a magnetic recording medium, and

(c) regions of impurity dopants within said substrate, and conductive means overlying said regions to form therewith electronic components, said electronic components being electrically cooperative with said film of magnetic material to effect recording and/or playback of said signals on and/or from said recording medium, whereby magnetic and electronic components associated with said magnetic head structure are provided in common association with the same substrate.

4,477,854
PORTECTIVE RELAY WITH SECOND HARMONIC SUPPRESSION

Masaji Usui, and Akiyoshi Honma, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1983, Ser. No. 501,085
Claims priority, application Japan, Jun. 23, 1982, 57-109205; Jun. 23, 1982, 57-109206
Int. Cl.³ H02H 7/045
U.S. Cl. 361—36 8 Claims



1. A protective relay with second harmonic suppression comprising:

a ratio differential element for comparing the amount of a differential current with the amount of a suppression current and producing an output signal when the amount of said differential current is greater than a predetermined value;

a second-harmonic detection element for detecting a second harmonic component in said differential current and producing an output signal when the content proportion of the second harmonic component is higher than a predetermined value;

a monostable multivibrator circuit operating in response to any amount of said differential current in excess of the predetermined value and producing an output signal for a preset period of time;

a first logic curcuit receptive of, as two inputs thereto, both the output of said monostable multivibrator circuit and the output of said second-harmonic detection element, and producing an output signal therefrom when said two inputs are received simultaneously;

a timing circuit for clocking the output duration of said second-harmonic detection element and producing a signal when said output duration reaches a predetermined period of time;

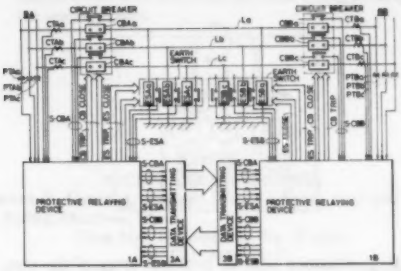
a second logic circuit receptive of, as two inputs thereto, both the output of said timing circuit and the output of said first logic circuit, and producing a second-harmonic suppression signal therefrom when at least one of said two inputs is received; and

a third logic circuit receptive of, as two inputs thereto, both the second-harmonic suppression signal of said second logic circuit and the output of said ratio differential element, and serving to suppress the output of said ratio differential element when said second-harmonic suppression signal is received.

4,477,855
PROTECTING SYSTEM FOR TRANSMISSION LINES

Keizo Nakayama, Hitachi, and Kazuo Seo, Tohkai, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 8, 1982, Ser. No. 396,376
Claims priority, application Japan, Jul. 10, 1981, 56-108633
Int. Cl.³ H02H 9/04
U.S. Cl. 361—54 4 Claims



1. A transmission line protecting system for protecting transmission lines which each have first terminals at one end and second terminals at another end, said system comprising:

protecting relay devices connected with the first and second terminals of the transmission lines;

breakers coupled to said first and second terminals of said transmission lines for breaking fault currents along said transmission lines in response to commands from said protecting relay devices;

grounding switches connected with the first and second terminals of said transmission lines; and

a transmission circuit for transmitting the open and closed states of said breakers and said grounding switches at the first and second terminals of the transmission lines,

wherein said system further includes means for only closing said grounding switches of a transmission line after it is confirmed through said transmission circuit that the breakers at the first and second terminals of the transmission line are opened when one or more of said transmission lines are faulted.

4,477,856
RELAY SPARE CIRCUIT FOR A RECLOSER RELAY

Robert P. DePuy, Cherry Hill, N.J., assignor to General Electric Company, King of Prussia, Pa.

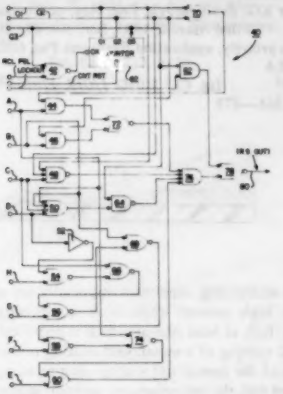
Filed Sep. 30, 1982, Ser. No. 429,718
Int. Cl.³ H02H 3/04, 3/06
U.S. Cl. 361—72 15 Claims

1. A relay spare circuit for a recloser relay, comprising:

(a) a first plurality of switches for developing a first series of signals defining which of a plurality of available relay reclosures are to occur;

(b) a second plurality of switches for developing a second series of signals defining which of the plurality of available relay reclosures are to be accompanied by the occurrence of a relay spare; and

(c) logic means for receiving the first and second series of signals and for developing a relay spare output signal for causing the relay spare to occur in accordance with the relay reclosures and relay spares selected using the first and second switches, and the condition of the recloser relay throughout a reclose cycle comprised of the relay

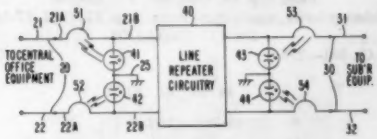


reclosures which are to occur, and during which reclosure of the recloser relay is attempted.

4,477,857
PRINTED CIRCUIT FUSE

Angus M. Crocker, Menlo Park, Calif., assignor to GTE Network Systems Corporation, Phoenix, Ariz.

Filed Dec. 27, 1982, Ser. No. 453,645
Int. Cl.³ H02H 9/06
U.S. Cl. 361—119 6 Claims



4. Apparatus comprising:

a printed circuit board,

first and second line conductors printed on said board with one ends thereof spaced apart to form a gap therebetween that presents an open circuit in series in the lines, said first line having the other end thereof electrically connected to electrical equipment, said one end of said first line having a pad thereon with an edge thereof defining the gap and a width and surface area that are greater than those of said one end of said second line;

a solder bridge electrically connected between said pad and the adjacent one end of said second line with a minimum amount of solder on the pad; and

a surge arrestor on said circuit board and proximate said pad and solder bridge and electrically connected between one of said first and second lines and one of a third line and a ground reference potential, said surge arrestor breaking down and conducting for a voltage on said first and second lines which is greater than a prescribed voltage for bypassing current on said lines through the surge arrestor, with the surge arrestor being heated by the bypassed line current, whereby a high voltage condition that is generally sustained on the line for greater than a prescribed net time interval heats the surge arrestor sufficiently to melt the solder bridge whereby the melted solder is drawn up onto the pad and away from the gap for presenting an open circuit in said first and second lines which interrupts line current and thereby protects the electrical equipment.

4,477,858

SELFHEALING CONDENSER

Holger Steiner, Erndtebrück, Fed. Rep. of Germany, assignor to Steiner KG, Erndtebrück, Fed. Rep. of Germany

Filed Mar. 4, 1983, Ser. No. 472,109
Claims priority, application European Pat. Off., Mar. 6, 1982, 82101789.4
Int. Cl.[3] H01G 1/017, 1/015
U.S. Cl. 361—273 14 Claims

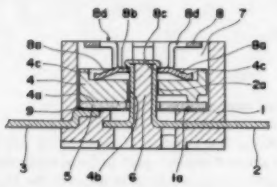
1. In a selfhealing condenser, especially for alternating current and high current application comprising at least two dielectric foils at least one of which is provided with a vapor-deposited coating of a metal, said coating terminating short of one edge of the coated foil and running to an opposite edge of the coated foil, the improvement wherein said coating consists of an aluminum-zinc alloy, the aluminum concentration in said alloy is at least 80% by weight at the side of said coating adjacent the coated foil and is at most 20% by weight at the surface of said coating remote from the coated foil, the aluminum concentration in said coating being substantially 5 to 40% by weight.

4,477,859

ROTARY ELECTRIC COMPONENT

Yukihiro Azuchi, Sabae, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 19, 1983, Ser. No. 533,548
Claims priority, application Japan, Sep. 22, 1982, 57-165711
Int. Cl.[3] H01G 5/06
U.S. Cl. 361—278 5 Claims



1. A rotary electric component which comprises:

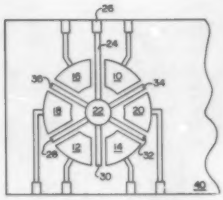
a support structure made of synthetic resin, at least one first elongated electric terminal member made of electroconductive material and having one end positioned exteriorly of the support structure for the electric connection with an external circuit element, a rotor, and a second elongated electric terminal member made of electroconductive material and having one end positioned exteriorly of the support structure for the electric connection with an external circuit element, said first and second terminal members being partially embedded in the support structure with at least one portion the other ends of said first and second terminal members located generally adjacent to each other, said second terminal member being formed at the side of its other end into a tubular shaft for the support of the rotor for rotation thereabout, said shaft having a closed end at the tip thereof, said closed end of the shaft being, after the rotor has been mounted thereon for rotation thereabout relative to the support structure, rivetted so as to expand radially outwards to hold the rotor in position.

4,477,860

ELECTRODE ARRAY

Thomas D. Wason, Raleigh, and Charles J. Cain, Greenville, both of N.C., assignors to Cain Encoder Company, Greenville, N.C.

Filed Sep. 19, 1983, Ser. No. 533,182
Int. Cl.[3] G08C 19/10; G01R 27/26
U.S. Cl. 361—306 3 Claims



1. In combination with an electrode array of the type in which a plurality of electrodes are deposited on one surface of a carrier plate symmetrically about a center electrode, which in turn is deposited on the same surface of said carrier plate, and in which it is desired to electrically connect said center electrode with a contact point outside said electrode array without disrupting the detected signal at said center electrode, the improvement comprising:

(a) at least one conductive strip deposited on said one surface of said carrier plate and extending from said center electrode between two adjacent ones of said plurality of electrodes to said outside point; and

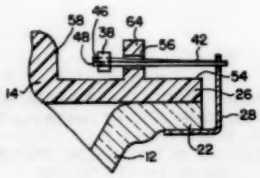
(b) other conductive strips of the same size and shape as said one conductive strip also deposited on said one surface of said carrier plate and extending from said center electrode between each adjacent ones of the remaining electrodes.

4,477,861

WATTHOUR METER WITH TAMPER RESISTANT SEAL

Thomas M. Byrd, Jr., Cary, N.C., and Khalil F. Aboujaoude, Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 14, 1982, Ser. No. 434,199
Int. Cl.[3] H02B 9/00
U.S. Cl. 361—371 6 Claims



1. A watthour meter container comprising:

a base assembly supporting a watthour meter movement and including circularly arcuate, circumferentially spaced, attachment lugs extending radially at the outer periphery thereof, which lugs have forward and rear side radial surfaces;

a cup-shaped cover including a closed forward end and an open rear end, and including a circular mounting flange extending radially outward at the rear open end, with a rear radial side surface mating with the front radial side surface of the attachment lugs, and including a locking rim carrying tabs rotationally attaching and locking the cover

to the attachment lugs to enclose the watthour meter movement within a protective container;

the base and the rim comprising substantially aligned aperture means; and

sealing means securing the base and cover body in place and including a wire and a deformable body, the wire extending through the aperture means with opposite end portions of the wire being embedded within the body;

whereby rotation of either of the base assembly or the cup-shaped cover with respect to the other causes breakage of the sealing means.

4,477,862

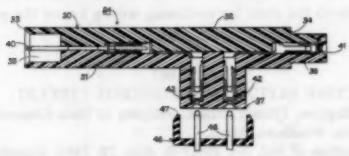
BACKPLANE CONNECTOR

Roman Y. Gonzales, Andover, Mass., assignor to Gould Inc., Rolling Meadows, Ill.

Filed May 19, 1982, Ser. No. 379,644

Int. Cl.³ H05K 7/10

U.S. Cl. 361—393 12 Claims



1. A backplane connecting system comprising a plurality of identically constructed backplane connector units, each being in electronic interengagement with adjacent connector units and mating electronic engagement with electronic modules mounted therewith, each of said backplane connector units comprising

A. a single independent, self-supporting, unitary structure incorporating

a. two side surfaces, and

b. a module receiving surface interposed between said two side surfaces;

B. a tongue portion

a. extending outwardly from one of said side surfaces, and

b. incorporating a first set of contact means arrayed therein;

C. a groove portion

a. formed in the second of said side surfaces,

b. each groove portion receiving therewithin the tongue portion of an identically constructed separate, adjacent backplane connector unit, and

c. incorporating a second set of contact means arrayed therein and in cooperative, positive, removable contact, with the first set of contact means in the tongue portion of the identically constructed, separate, adjacent backplane connector unit; and

D. module receiving contacts mounted to said module receiving surface and positioned for mating electronic interengagement with a module to be mounted thereto,

whereby a backplane connecting system is achieved which a plurality of identical independent, self-supporting backplane connectors directly, matingly electronically interengage with each other in an easily achieved "plug and socket" manner, while also being capable of electronic interengagement with a plurality of modules mounted to a particular connector for carrying the desired electronic signals between the module and its associated controlled equipment.

4,477,863

WORK-LIGHT

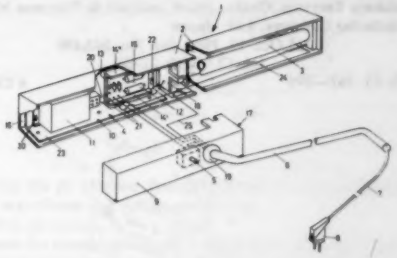
Alfred Walz, Am Kurzarm 7, D - 7830 Emmendingen, Fed. Rep. of Germany

Filed Feb. 25, 1983, Ser. No. 469,810

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1982, 8205219[U]

Int. Cl.³ F21V 9/16

U.S. Cl. 362—84 16 Claims



1. A work light comprising a housing, a gas discharge lamp positioned inside a portion of said housing, a power supply cable connected to said housing, means defining a compartment which is an extension of said portion of said housing, and a smoothing choke and a rectifier including a voltage multiplier circuit mounted in said compartment.

4,477,864

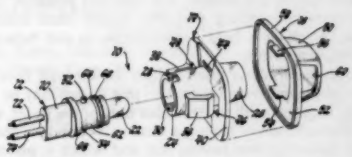
LAMP ASSEMBLY

Paul D. Van Duyn, and Jerry J. Johnson, Sr., both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 15, 1982, Ser. No. 398,671

Int. Cl.³ F21V 3/02, 17/04

U.S. Cl. 362—311 2 Claims



1. A lamp assembly adapted to be mounted in an opening in a support panel for directing a beam of light emanating from a light bulb towards an object, said light bulb being supported in a lamp socket having one part of a connector means, said lamp assembly including a body portion having a closed end and an open end, said open end adapted to receive said lamp socket and being formed with the other part of said connector means for cooperation with said one part so as to fixedly secure said lamp socket to said body portion and locate said light bulb adjacent said closed end of said body portion; a collar integrally formed with and extending radially from said body portion and being located substantially midway between said closed end and said open end thereof; a pair of spring arms integrally formed on said body portion at diametrically opposed points thereof, each of said spring arms having one end thereof connected to said body portion adjacent said open end and having the other end extending towards said closed end and terminating at said collar, said spring arms adapted to cooperate with said collar for maintaining said lamp assembly in said opening in said support panel, and a cover made of a plastic material and secured to said collar, said cover comprising a dome portion integrally formed with a radially extending

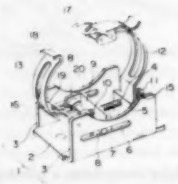
base which corresponds in size and configuration with the size and configuration of said collar, a skirt surrounding said base of said cover and located along the periphery of said collar, said collar having an opening formed in said dome portion so as to cause said beam of light emanating from said light bulb to be directed towards said object.

4,477,865

MOUNTING DEVICE FOR LIGHTING DEVICE FOR BICYCLE

Sadaharu Tsuyama, Osaka, Japan, assignor to Tsuyama Manufacturing Company, Ltd., Japan

Filed Oct. 19, 1983, Ser. No. 543,498
Int. Cl.³ F21V *21/00*
U.S. Cl. 362—396 **4 Claims**



1. A mounting member for releasably holding a device for a bicycle comprising:

a base having a horizontally fixed portion and a pair of vertical portions extending from opposing sides of the horizontally fixed portion, each vertical portion having an elongated bearing slot, the bearing slots being in opposed relation, the base being adapted to be fixed to the bottom of the device, the base including an upright member fixed between the vertical portions, the upright member containing a through hole,

a slidable shaft member bridged between the bearing slots of the vertical portions of the base, the slidable shaft member being freely movable in a longitudinal direction,

a slider having a threaded hole and end portions, the end portions cooperating with the slidable shaft member so that the slider is held perpendicular to and between the vertical portions,

an adjustment screw inserted into the through hole of the upright member on the base so that its end may be adjustably engaged with the threaded hole of the slider, and the adjustment screw having a head at its opposite end,

a first fastening arm having one end which is inserted between the head of the adjustment screw and the through hole of the upright member on the

a second fastening arm having one end rotatably fixed on the slidable shaft member and first fastening arm, and

one touch engaging means for detachably fastening the first and second fastening arms to secure the device upon a bicycle.

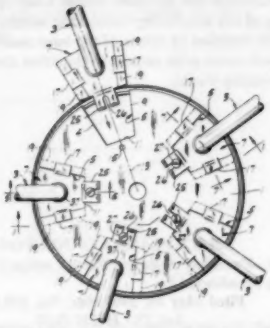
4,477,866

CHANDELIERS

Charles D. Goralnik, St. Louis County, Mo., assignor to Vogue Lighting, Inc., St. Louis, Mo.

Filed Oct. 26, 1983, Ser. No. 545,685
Int. Cl.³ F21M *3/18*
U.S. Cl. 362—427 **22 Claims**

1. A chandelier comprising a tubular center column, a circular arm supporting plate attached to the lower end of the column, a plurality of arms mounted on the plate, each arm being a metal tubular arm having a downwardly extending inner end portion attached at its lower end to the plate, an outwardly extending intermediate portion and an upwardly extending outer end portion carrying a lamp socket, the attachment of each arm to the plate and the attachment of the plate to the column being such as to enable the chandelier to be packaged with the plate detached from the column and with the arms in a nested condition, and to enable the plate to be attached to the column and the arms set in operative position extending radially outwardly from the plate, the arms accommodating wiring with the wiring extending through the column to below the plate and out to and up through the lower ends of the inner end portions of the arms, and a housing attachable to the plate for enclosing wiring below the plate.

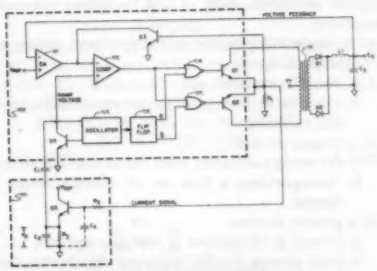


4,477,867

CORE SATURATION CONTROL CIRCUIT

John Pellegrino, Quincy, Mass., assignor to Data General Corporation, Westboro, Mass.

Continuation of Ser. No. 297,376, Aug. 28, 1981, abandoned.
This application Dec. 22, 1983, Ser. No. 564,590
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—26 **6 Claims**



1. A pulse width modulated power supply comprising:

means for receiving a reference voltage;

means for amplifying the error between said reference voltage and the output voltage of said power supply;

means for repetitively generating a ramp voltage;

means for comparing said ramp voltage with said amplified error voltage;

transformer means;

a first transistor connected such that current flowing through said first transistor will flow through the primary winding of said transformer means in a first direction;

a second transistor connected such that current flowing through said second transistor will flow through the primary winding of said transformer means in a second direction;

gate means connected between the output of said comparing means and said transistors;

means for alternately enabling portions of said gate means

such that the output of said comparison means is supplied to only one of said transistors at a time; and

means for comparing the rate of increase of the current in said primary winding with the rate of increase of said ramp voltage and providing a voltage to said comparing means if the rate of increase of the current in said primary winding exceeds the rate of increase of said ramp voltage, said voltage from said comparing means being added to said ramp voltage, whereby the on-time of each of said transistors is related to the current in said primary winding while said transistor is on, whereby each of said transistors carries a substantially equal peak current.

4,477,868

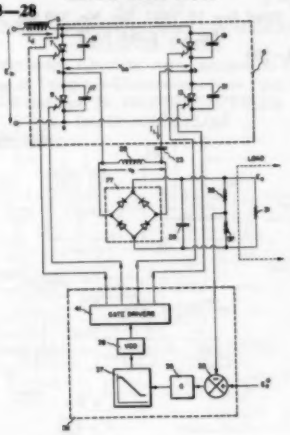
HIGH FREQUENCY SERIES RESONANT DC-DC CONVERTER

Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,760

Int. Cl.³ H02P *13/22*

U.S. Cl. 363—28 **8 Claims**



1. A resonant dc-dc converter comprising:

a current input inverter having gate turn off switch means capable of blocking reverse current, said inverter being supplied by an external dc power source and said inverter supplying square waves of current;

a resonant circuit having an inductor connected in series with a capacitor, the output of said inverter being available across said inductor;

rectifier means coupled across said inductor to rectify the sinusoidal voltage across said inductor to provide a dc output voltage; and

control means for controlling the dc output voltage by varying the frequency at which said gate turn-off switch means operate, said control means having comparison means for comparing a commanded output voltage to the actual output voltage to develop an error signal, a voltage controlled oscillator coupled to switch means, and limit means for providing a lagging load to said inverter by limiting the error voltage supplied to said voltage controlled oscillator so that the switching frequency of the switch means is at or above the damped resonant frequency of the resonant circuit to reduce switching losses.

4,477,869

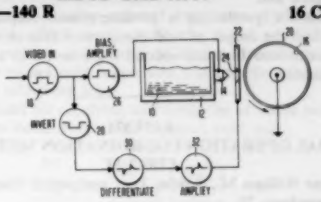
PULSED APERTURE FOR AN ELECTROSTATIC INK JET SYSTEM

Robert E. Rudd, III, Maywood, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 28, 1983, Ser. No. 489,503

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **16 Claims**



1. An ink jet printing system responsive to a video signal input waveform, said system comprising:

an ink jet nozzle;

means for supplying a liquid imaging material to said nozzle;

a conductive platen, positioned in spaced relationship to and opposite the exit oriface of said nozzle;

a recording member interposed between said platen and said nozzle;

a conductive plate having an aperture, said plate positioned in spaced relation between said recording member and said nozzle;

first means, responsive to said video signal input waveform, for producing and applying a first potential waveform between said plate and said platen; and

second means, responsive to said video signal input waveform, for producing and applying a second potential waveform between said nozzle and said platen.

4,477,870

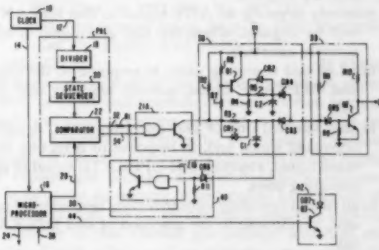
DIGITAL CONTROL SYSTEM MONITOR HAVING A PREDETERMINED OUTPUT UNDER FAULT CONDITIONS

Mark G. Kraus, Churchill Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 26, 1982, Ser. No. 382,436

Int. Cl.³ G06F *11/00*

U.S. Cl. 364—186 **10 Claims**



1. A control system monitor comprising:

means for generating a first sequence of data words, said data words being representative of the operating status of a system being monitored;

means for producing a second sequence of data words;

a comparator for comparing data words of said first sequence of data words with data words of said second sequence of data words wherein corresponding data words in said first and second sequence of data words are

presented to said comparator during successive time intervals, said successsive time intervals overlapping for a preselected time;

said comparator producing a first logic level output when said data words being compared agree and a second logic level output when said data words being compared disagree; and

means for producing a predetermined output condition when the output of said comparator fails to oscillate between said first and second logic levels in a prescribed manner.

4,477,871

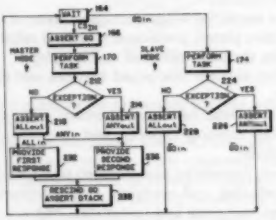
GLOBAL OPERATION COORDINATION METHOD AND CIRCUIT

Keshlear William M., Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 324,183, Nov. 23, 1981,. This application Dec. 14, 1981, Ser. No. 330,050

Int. Cl.[3] G06F *13/00*

U.S. Cl. 364—200 2 Claims



1. A method for coordinating the parallel operation of a plurality of operating units in response to an assertion of a command signal to a selected one of said operating units, each of which performs a respective task which may be subject to the occurance of an exception condition during the performance thereof, comprising the steps of:

passively negating an OPERATE signal so that said OPERATE signal will be negated whenever said OPERATE signal is not being actively asserted;

passively asserting an ALL signal so that said ALL signal will be asserted whenever said ALL signal is not being actively negated;

passively negating an ANY signal so that said ANY signal will be negated whenever said any signal is not being actively asserted;

in all of said operating units, in response to the negation of said OPERATE signal, actively negating said ALL signal;

in said selected one of said operating units, detecting said command signal and, in response to detecting said command signal, asserting said OPERATE signal to all of said operating units;

in all of said operating units including said selected operating unit, in response to the assertion of said OPERATE signal:

initiating the performance of said respective task;

continuing to actively negate said ALL signal while performing said respective task; and

upon performing said task, either actively asserting said ANY signal in response to the occurance of said exception condition during the performance of said respective task, or terminating the negation of said ALL signal in response to the failure of said exception condition to occur during the performance of said respective task;

in said selected one of said operating units, either providing a first response to an assertion of said ALL signal or a second response to an assertion of said ANY signal, and negating said OPERATE signal in response to an assertion of either of said ALL and ANY signals; and

in all of said operating units, in response to the negation of said OPERATE signal by said selected one of said operating units, actively negating said ALL signal if said ALL signal is not then being actively negated by said respective operating unit, and terminating the active assertion of said ANY signal if said ANY signal is then being actively asserted by said respective operating unit;

whereby the asserting of said OPERATE signal indicates that all of said operating units are to perform said respective tasks, the asserting of said ANY signal indicates that said exception condition occured during the performance by at least one of said operating units of said respective tasks, and the asserting of said ALL signal indicates that said exception condition failed to occur during the performance by all of said operating units of said respective tasks.

4,477,872

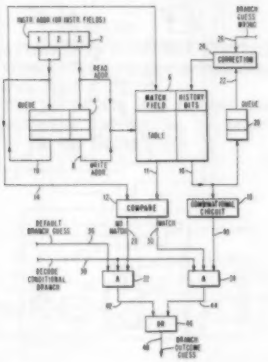
DECODE HISTORY TABLE FOR CONDITIONAL BRANCH INSTRUCTIONS

Jacques J. Losq, Palo Alto, Calif.; Gururaj S. Rao, Yorktown Heights, and Howard E. Sachar, New Paltz, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1982, Ser. No. 339,561

Int. Cl.[3] G06F *9/38*

U.S. Cl. 364—200 4 Claims



1. In a computing machine, apparatus for predicting the outcome of conditional branch instructions, the combination comprising:

an address queue in which the addresses of conditional branch instructions that have been successfully decoded, but have not finished being executed are stored;

an address and history table in which at least a portion of the addresses of conditional branch instructions are stored, including at least one stored history bit associated with each of said conditional branch instructions which is indicative of whether or not the previous executions of the associated conditional branch instruction resulted in a branch being taken;

an instruction address register in which the address of a given conditional branch instruction is stored during the instruction decode cycle, wherein said address contains a match portion and a read portion, including means for transferring said address of said given conditional branch instruction to said address queue, and applying said read portion to said address and history table for reading out said at least a portion of the address of said given conditional branch instruction and its associated said at least one history bit;

a compare network which has the match portion of the

address of said given conditional branch instruction applied to a first input thereof from said instruction address register, and which has said at least a portion of the address of said given conditional branch instruction read out from said address and history table applied to a second input thereof, with said compare network having a MATCH output and a NO MATCH output, which provide a gating signal at the respective outputs when the address information applied to said first and second inputs does and does not match, respectively;

a combinational circuit to which said at least one history bit read out of said address and history table is applied, with said combinational circuit providing a one bit binary output signal which indicates that execution of said conditional branch instruction will result in a branch being taken or not taken when in a first binary state or a second binary state, respectively; and

first means for indicating the probable outcome of said given conditional branch instruction based on the one binary output signal from said combinational circuit whenever there is a gating output signal provided at the MATCH output of said compare network.

4,477,873

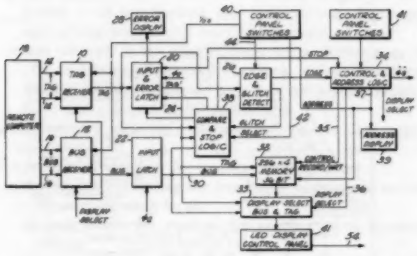
CHANNEL MONITOR FOR CONNECTION TO CHANNEL LINES

Edgar L. McCarley, Glendale, Ariz., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Apr. 29, 1982, Ser. No. 373,254

Int. Cl.³ G06F *11/34*

U.S. Cl. 364—200 **6 Claims**



1. Apparatus coupled to the I/O channel between a digital computer and a locally attached remote device for monitoring, in real time, the activities of said channel, said channel including a plurality of data and command lines comprising:

first means for selecting which of said lines are to be monitored;

second means coupled to said first means to determine the period of the signals on said selected lines;

and third means including a memory for recording said signals on said selected lines if the period of all the signals on said selected lines is greater than a first predetermined period.

4,477,874

CARD-OPERATED CONTROL SYSTEM FOR VEHICLE COMPONENTS

Hiroshi Ikuta, Okazaki, and Takaaki Kato, Toyohashi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 24, 1981, Ser. No. 324,572

Claims priority, application Japan, Nov. 25, 1980, 55-165462

Int. Cl.³ B60R *25/04, 25/10*; G06F *15/20*

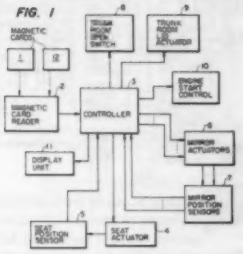
U.S. Cl. 364—424 **4 Claims**

3. A control system for a vehicle having a plurality of actuators including a mirror actuator and a seat actuator and a plurality of lock-controlled units including a lock-controlled engine and a lock-controlled trunk lid, comprising:

a first card bearing personal data items of a vehicle owner indicating a seat position and a mirror position and security data items for authorizing the vehicle owner to unlock said lock-controlled units;

a second card bearing personal data items of a user other than said vehicle owner indicating a seat position and a mirror position and security data items for authorizing the user to unlock said engine and unauthorizing the user to unlock said trunk lid;

a card reader for receiving said cards one at a time to detect the data items from a said received card; and



a controller for providing seat position and mirror position control signals to said seat and mirror actuators respectively in response to the detected personal data items and checking the detected engine and trunk-lid security data items against stored engine and trunk-lid authorize data items to detect a match therebetween and unlocking said engine and trunk lid when the detected engine and trunk-lid security data items match the stored authorize data items and keeping said trunk lid locked when the detected trunk-lid security data item mismatches the stored authorize data item.

4,477,875

CONTROL SYSTEM FOR EXHAUST GAS-DRIVEN SUPERCHARGER USED IN VEHICLE ENGINE

Satoshi Suzuki, and Hiroyuki Ando, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 28, 1981, Ser. No. 267,723

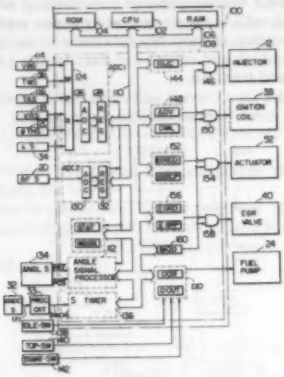
Claims priority, application Japan, May 28, 1980, 55-70154

Int. Cl.³ F02B *37/12*; F02D *23/02*

U.S. Cl. 364—431.08 **21 Claims**

1. A system for controlling an exhaust gas-driven supercharger used in an internal combustion engine for an automotive vehicle including a turbine disposed in an exhaust gas passage of the engine to be driven by the stream of exhaust gases discharged from the combustion chambers of said engine into said exhaust gas passage, a supercharging compressor disposed in an intake air passage of said engine to be driven by said turbine, an exhaust gas bypass passage connecting between selected portions of said exhaust gas passage upstream and downstream of said turbine, and an exhaust bypass valve disposed midway of said exhaust gas bypass passage for regulating the quantity of exhaust gases flowing through said exhaust gas bypass passage, said control system comprising a plurality of electrical signal generating means for generating electrical signals indicative of the operating condition of said engine, knocking signal generating means for sensing the presence or absence of knocking in said engine and generating an electrical signal indicative of occurrence of knocking when knocking is present, control circuit means including memory means for storing a series of basic data of the controlled opening of said exhaust bypass valve corresponding to various operating conditions of said engine, said control circuit means reading out from said memory means a basic data of the controlled opening

of said exhaust bypass valve on the basis of the electrical signals generated from said electrical signal generating means and, when said knocking signal generating means senses occurrence of knocking and generates the electrical signal indicative of occurrence of knocking, modifying the read-out basic data



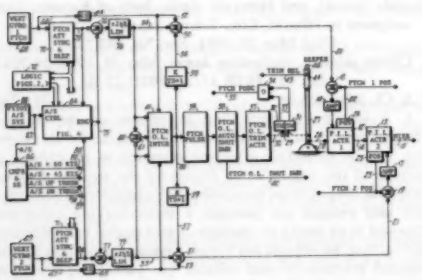
of the controlled opening thereby generating a corresponding digital output signal so as to provide a modified supercharged air pressure at which knocking does not occur, and actuator means for actuating said exhaust bypass valve in response to the digital signal applied from said control circuit means.

4,477,876

DUAL RESPONSE AIRCRAFT REFERENCE SYNCHRONIZATION

Stuart C. Wright, Milford; Don L. Adams, Fairfield; William C. Fischer, Monroe, and David J. Verzella, Guilford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 30, 1981, Ser. No. 248,768
Int. Cl.³ G06F *15/50*; B64C *13/18*; G05D *1/08*
U.S. Cl. 364—434 **5 Claims**



1. A system for positioning attitude-controlling aerodynamic surfaces of an aircraft, comprising:

attitude means for providing an actual attitude signal indicative of the actual attitude of the aircraft in a control axis thereof;

trim release means selectively operable by the pilot of the aircraft to provide a trim release signal;

actuator means responsive to a command input signal applied thereto for positioning said aerodynamic surfaces; and

signal processing means, responsive to said attitude means and said trim release means for providing, during the presence of said trim release signal, an attitude reference signal indicative of the attitude desired for the aircraft in said control axis in response to said actual attitude signal, for providing an attitude error signal indicative of the difference between said attitude reference signal and said actual attitude signal, and for providing to said actuator means an attitude command signal indicative of a desired change in aircraft attitude in response to said attitude error signal;

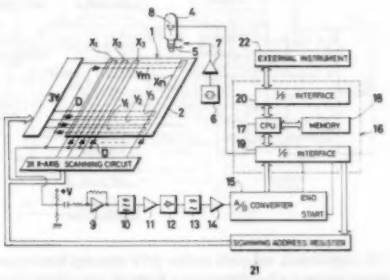
characterized by said signal processing means comprising means for providing said attitude reference signal in a manner to synchronize said attitude reference signal with said actual attitude signal at a first rate in response to the initial provision of said trim release signal and for a period of time thereafter, and for providing said attitude reference signal in a manner to synchronize said attitude reference signal with said actual attitude signal at a second rate at least an order of magnitude faster than said first rate in response to the provision of said trim release signal after expiration of said period of time.

4,477,877

COORDINATE DETERMINING DEVICE

Kohichi Nakamura, and Yoshiyuki Morita, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jun. 10, 1981, Ser. No. 272,290
Claims priority, application Japan, Jul. 10, 1980, 55-94357
Int. Cl.³ G08C *21/00*; G06F *15/20*
U.S. Cl. 364—571 **5 Claims**



1. A coordinate determining device comprising: a tablet having a plurality of sensing lines disposed thereon and spaced from each other; a coordinate indicator having a coil and being movable and inclinable relative to the tablet for indicating a coordinate on the tablet; means for generating an alternating magnetic field from the coil to induce electromotive voltages within the sensing lines; means for detecting the induced electromotive voltage generated from each of the sensing lines by scanning them in turn; and arithmetic control means for computing the position of the coordinate indicator by detecting the maximum voltage value of the detection signals generated in the sensing lines and the voltage values of the detection signals of the sensing lines neighboring the sensing line which generates the maximum voltage value detection signal, said arithmetic control means including means for detecting the secondary peak voltage values of the voltages within sensing lines remote from the sensing line having the maximum voltage value, and means to compensate for an error of the computed position caused by an inclination of the coordinate indicator relative to the tablet by using the detected secondary peak voltage values of the voltages within sensing lines remote from the sensing line having the maximum voltage value.

4,477,878
DISCRETE FOURIER TRANSFORM WITH NON-TUMBLED OUTPUT

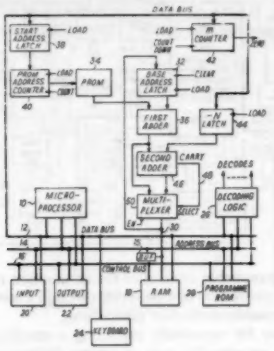
Stephen N. Cope, Farnborough, England, assignor to Solartron Electronic Group Limited, Farnborough, England

Filed Sep. 3, 1981, Ser. No. 299,258

Claims priority, application United Kingdom, Sep. 19, 1980, 8030333

Int. Cl.³ G06F *15/31*

U.S. Cl. 364—726 **8 Claims**



1. Apparatus for performing the discrete Fourier transform comprising:

a data memory for storing data relating to groups of old points to be transformed and data relating to groups of new points which have been transformed;

means coupled to the data memory for performing, in each of a succession of levels of transform, elementary discrete Fourier transforms on said groups of old points, thereby to form said groups of new points; and

data memory addressing means coupled to the data memory including:

an address memory for storing address values;

first means for storing the number N of points to be transformed for each level;

second means for storing the number m of groups of points;

further addressing means for repeatedly addressing sequences of locations in said address memory to read out said address values; and

address generating means responsive to said first and second storing means and to the output of said address memory for generating a predetermined series of addresses for reading out said old points from the data memory and writing back said new points into the data memory, wherein said series of addresses is non-sequential for at least one of said reading out and writing back operations performed on said points.

4,477,879
FLOATING POINT PROCESSOR ARCHITECTURE WHICH PERFORMS SQUARE ROOT BY HARDWARE

Wilson T. C. Wong, Irvine, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 28, 1981, Ser. No. 334,557

Int. Cl.³ G06F *7/552*

U.S. Cl. 364—752 **16 Claims**

1. A floating point processor (FPP) architecture which permits square root operations, comprising,

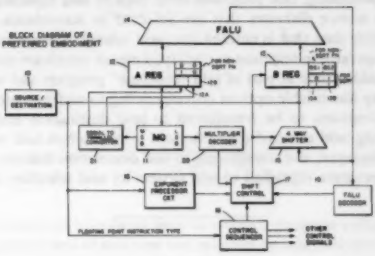
first register means for storing a signal to be operated upon, arithmetic logic circuit means,

second register means connected to supply signals to and receive signals from said arithmetic logic circuit means,

third register means connected to supply signals to and receive signals from said arithmetic logic circuit means,

said second register means and said third register means have the contents thereof offset by a portion of the length of the signals supplied thereto,

circuit means connected from said first register means to said second register means to supply signals to an end of the signal extant in said second register means,



shifter means connected to receive signals from said arithmetic logic circuit means and to supply signals to each of said first, second and third register means,

said shifter means operative to selectively shift the signals supplied thereto either to the left or to the right, and

control means connected to said shifter means to control the operation thereof.

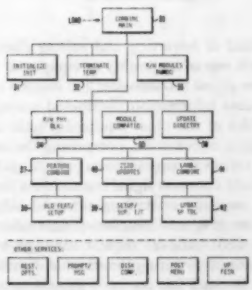
4,477,880
METHOD FOR COMBINING PROGRAM DISKETTES IN AN INTERACTIVE TEXT PROCESSING SYSTEM

Hira Advani; William C. Cason, and Gerald E. Hayes, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 13, 1981, Ser. No. 311,083

Int. Cl.³ G06F *1/00*

U.S. Cl. 364—900 **13 Claims**



1. In an operator controlled interactive text processing system having a keyboard, display device, and a diskette drive for interactively entering programs into said system from a plurality of program source diskettes that are inserted individually into said diskette drive, said system performing test processing tasks that are selected by said operator interactively from menus which are displayed by said system to said operator from portions of said entered programs where said operator is required to insert said plurality of program source diskettes individually into said diskette drive whenever the desired text processing task to be performed by said operator requires a set of text processing task programs stored on different said program source diskettes, the method of combining a selected said set of said text processing task programs initially stored on said

plurality of different program source diskettes onto one destination diskette to avoid said operator inserting and removing said plurality of program source diskettes into and from said diskette drive each time said operator controls said system to execute said set of selected text processing task programs, said method comprising the steps of entering into said system a "combine" program and executing said combine program to cause said system to combine on said one destination diskette text processing task programs from each of said separate program source diskettes that are selected in accordance with selection data that is entered into said system interactively by said operator in response to displayed menus which are entered into said system as part of said "combine" program and which display identifiable options corresponding to said text processing programs to be transferred to said destination diskette, entering said selected data into said system when said menus are displayed, and transferring to said destination diskette each said program identified to said system by said selection data.

4,477,881

METHOD OF RETRIEVING AND EDITING DISTRIBUTED INFORMATION

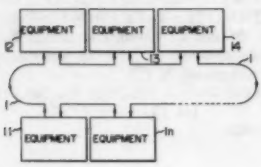
Nobuhisa Kobayashi, Katsuta; Kinji Mori, Kawasaki; Hirokazu Ihara, Machida, and Katuaki Ikeda, Kashiwa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 327,193

Claims priority, application Japan, Dec. 10, 1980, 55-173260

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—900 **14 Claims**



1. A method of retrieving and editing distributed information, in which one of a plurality of equipment units connected to a common signal transmission line issues a retrieval request to retrieve data information distributed among and stored in respective files of the other equipment units and to edit said distributed data information, comprising the steps of:

sending a retrieval request message from said one equipment unit to said common signal transmission line, said retrieval request message containing retrieval information necessary to retrieve said distributed data information;

receiving said retrieval request message by each of said equipment units storing therein said distributed data information, through said common signal transmission line, and retrieving a file of said each equipment unit on the basis of said retrieval information to retrieve said distributed data information;

sending data information retrieved in at least a first one of said equipment units storing therein said distributed data information to said common signal transmission line; and

receiving said data information detected in said first equipment unit, from said common signal transmission line, in at least two of said equipment units which store therein said distributed data information, wherein said at least two equipment units edit said received data information from said first equipment unit together with data information retrieved in said two equipment units and wherein said at least two equipment units send the edited data information to said common signal transmission line.

4,477,882

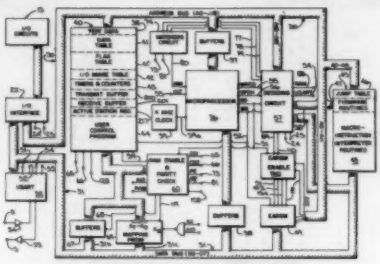
COMMUNICATIONS NETWORK FOR PROGRAMMABLE CONTROLLERS

Gary L. Schumacher, Mayfield Heights; Odo J. Struger, Chagrin Falls, and Ronald E. Schultz, Willoughby, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Feb. 24, 1982, Ser. No. 352,014

Int. Cl.³ G06F *3/00, 15/16*

U.S. Cl. 364—900 **8 Claims**



1. A programmable controller for connection to other programmable controllers in a network through a serial data link, the programmable controller comprising:

a processor for repeatedly executing a stored control program to examine the state of sensing devices connected to the programmable controller and to operate output devices connected to the programmable controller;

I/O image table means coupled to the processor for storing data indicative of the state of all sensing devices and output devices connected to the programmable controller;

data table storage means coupled to the processor for storing I/O image table data from each of the other programmable controllers in the network;

transmit means coupled to the processor and the I/O image table means for periodically sending the stored I/O image table data through said serial data link to other programmable controllers in the network;

receive means coupled to the serial data link for receiving I/O image table data from other programmable controllers in the network, the receive means being operable to momentarily interrupt the execution of the control program by said processor and to store the received I/O image table data in said data table; and

wherein the processor is operable during the execution of the control program to examine the state of the data table and to thereby determine the state of sensing devices and output devices connected to other programmable controllers in the network.

4,477,883

ELECTRICALLY ERASABLE PROGRAMMABLE READ ONLY MEMORY

Masashi Wada, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 18, 1982, Ser. No. 349,912

Claims priority, application Japan, Feb. 27, 1981, 56-26911

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—185 **14 Claims**

1. An electrically erasable and programmable read only memory device comprising:

a semiconductive substrate of one conductivity type;

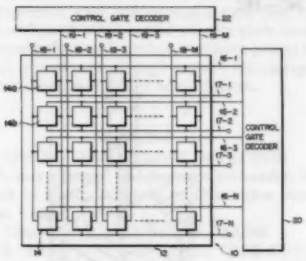
a plurality of memory cells arranged on said substrate in a matrix form, each memory cell comprising; first and second diffusion layers which are formed on said substrate to have a conductivity type opposite to that of said substrate, and which define a channel region therebetween, and a floating gate insulated from said substrate;

first control electrode layers capacitively and commonly coupled to floating gates of a first group of said plurality

of memory cells which are included in each array of a first number of cell arrays aligned in a first direction of said memory cell matrix, said first control electrode layers being insulated from said substrate;

second control electrode layers capacitively and commonly coupled to floating gates of a second group of said plurality of memory cells which are included in each array of a second number of cell arrays aligned in a second direction that intersects said first direction of said memory cell matrix substantially at right angles, said second control electrode layers being insulated from said substrate and said first control electrode layers;

third electrode layers each of which is commonly coupled to



the first diffusion layers of said memory cells included in the corresponding one of said first number of cell arrays and which are electrically separated from said substrate and insulated from said floating gates and said first and second electrode layers, said third electrode layers being capactivively and commonly coupled to said floating gates of said memory cells included in each of said first number of cell arrays; and

means, electrically connected to said first, second and third electrode layers, for controlling the level of a voltage applied to said first, second and third electrode layers so as to selectively charge or discharge carriers only in or from the floating gate of an arbitrary memory cell of said matrix memory cells.

4,477,884

SEMICONDUCTOR MEMORY WITH IMPROVED DATA PROGRAMMING TIME

Hiroshi Iwahashi, Yokohama, and Masamichi Asano, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 13, 1981, Ser. No. 310,822

Claims priority, application Japan, Oct. 15, 1980, 55-143947; Oct. 15, 1980, 55-143948; Oct. 15, 1980, 55-143949

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—189 **9 Claims**

1. A semiconductor memory comprising:

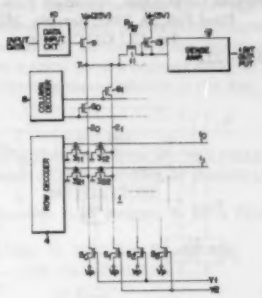
a memory array with a plurality of semiconductor memory cells arranged in a matrix form having column lines and row lines, and 1 or more bit outputs, a plurality of column lines being associated with each bit output;

column and row decoders responsive to address signals to select a memory cell associated with each of the bit outputs;

data input circuit means for writing data into a memory cell which is associated with each of the bit outputs and selected by said column and row decoders;

a program voltage source; and

a plurality of switching transistors connecting, when enabled, said plurality of column lines to said program voltage source, said switching transistors being grouped into first transistors and second transistors, said first transistors being enabled by a first gate signal and said second transistors being enabled by a second gate signal, so that a plurality of memory cells is simultaneously programmed for program testing, said plurality of memory cells being



connected to column lines to which a program voltage is applied and to one row line selected by said row decoder.

4,477,885

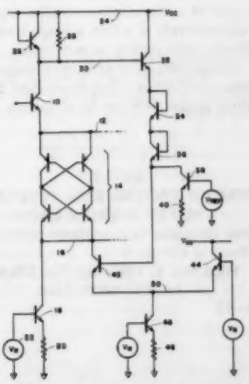
CURRENT DUMP CIRCUIT FOR BIPOLAR RANDOM ACCESS MEMORIES

Kenneth P. Sharp, Palo Alto, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain, Calif.

Filed Jan. 18, 1982, Ser. No. 340,145

Int. Cl.³ G11C *7/02, 8/00*

U.S. Cl. 365—204 **8 Claims**



1. A RAM current dump circuit for rapidly discharging a row of memory cells connected between top and bottom word lines upon deselection of the row by a word line driver, said dump circuit comprising:

(a) word line switch means, responsive to signals from said word line driver, coupled to said top word line for selectively applying a voltage thereto;

(b) current sensing means, coupled between said word line switch means and a V_{CC} source, for sensing changes in current through said word line switch means and producing a first voltage level when current is flowing through said switch means and a second voltage level when substantially no current is flowing through said switch means; and

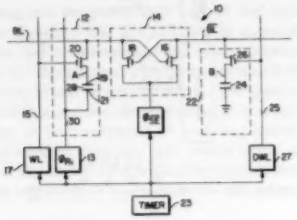
(c) current steering means, operatively associated with said current sensing means, for steering a dump current to said bottom word line in response to said second voltage level and away from said bottom word line in response to said first voltage level.

4,477,886

SENSE/RESTORE CIRCUIT FOR DYNAMIC RANDOM ACCESS MEMORY

Alexander C. Au, Los Altos, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Feb. 26, 1982, Ser. No. 352,967
Int. Cl.³ G11C 13/00
U.S. Cl. 365—222 4 Claims



1. In an integrated circuit memory device wherein a capacitive storge memory cell having a first terminal and a second terminal is coupled at said first terminal through a transfer gate to a bit line, the improvement for recharging said memory cell, comprising:

decoupling means coupled to said transfer gate for decoupling said first terminal from said bit line, said decoupling means including a word line voltage source for varying the magnitude of a charge on a word line connected to said transfer gate to thereby control the conduction of said transfer gate; and

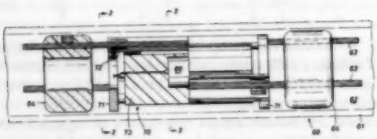
setting means coupled to said second terminal for setting a voltage level at said second terminal independently of said bit line alternatively to a first voltage level for recharging said memory cell during a restoration cycle, and to a second voltage level for reference during a read cycle, said memory cell being solely dependent for refreshing on said setting means voltage level during said restoration cycle.

4,477,887

LOW NOISE MOUNTING FOR ACCELEROMETER USED IN MARINE CABLE

Albert J. Berni, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 8, 1981, Ser. No. 300,430
Int. Cl.³ G01V 1/38
U.S. Cl. 367—20 11 Claims



1. A seismic streamer cable for use in marine seismic surveys, said cable comprising:

a flexible tubular member, said tubular member being filled with a liquid;

a plurality of stress members positioned in said flexible tubular member;

an acceleration-responsive transducer, said acceleration responsive transducer being potted in an outer case and adapted to measure the vertical component of acceleration independent of its orientation; and

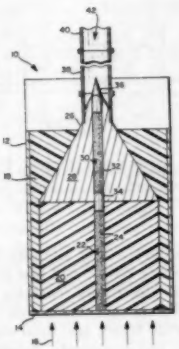
a body having an aperture therein for containing said outer case, said body being made of a material such that the density of the combination of said acceleration responsive transducer in said outer case and said body is substantially equal to the density of said liquid.

4,477,888

MICROWAVE SYSTEM FOR PARTICLE AND SHOCK VELOCITY MEASUREMENT IN A GEOLOGICAL TYPE MATERIAL

George Nagumo, Park Forrest, Ill.; Donald A. Miller, Lyme, Conn., and Paul Lieberman, Torrance, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 5, 1981, Ser. No. 318,500
Int. Cl.³ G01V 1/16; G01S 9/56
U.S. Cl. 367—152 11 Claims



1. A microwave system for measuring particle and shock velocity in a medium, comprising:

(a) a waveguide for embedding in a medium;

(b) microwave transmission means for coupling microwave signals at a preselected frequency to said waveguide;

(c) a dielectric, disposed within said waveguide, having mechanical properties substantially matched with the mechanical properties of the medium;

(d) a flexible element connected to one end of said waveguide for reflecting microwaves thereby providing a standing wave in the dielectric responsive to movement of said flexible element; and

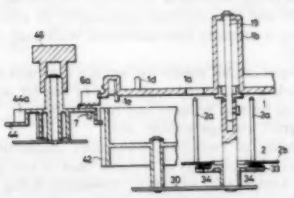
(e) a receiver responsive to said standing wave for determining the amount of movement of said standing wave.

4,477,889

RECORDING MEDIA SELECTING MECHANISM

Haruyoshi Miyako, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Jan. 18, 1983, Ser. No. 458,801
Claims priority, application Japan, Jan. 18, 1982, 57-4856
Int. Cl.³ G11B 17/22, 23/00, 5/012, 5/016
U.S. Cl. 369—35 11 Claims



1. A recording media selecting mechanism, comprising:

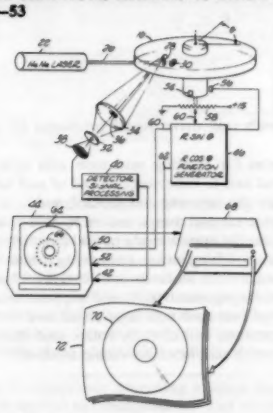
a rotary board (1) rotatably supported about an vertical axis (19) and having a recording media mounting portion;
means (17, 17*a*, 18) for rotating said rotary board;
a vertically movable selector plate (2) having selector rods (2*a*) which pass through holes (1*a*) formed in said recording media mounting portion of said rotary board, a gear portion (2*b*) being formed at an outer circumferential periphery of said selector plate, said gear portion being rotatable coaxially with said rotary board;
rotatable recording media selector means (46);
a transmission gear (42) which is rotated by rotation of said rotatable recording media selector means, rotation of said transmission gear causing said selector plate to rotate;
one of either said selector plate and said transmission gear having increased thickness wherein said selector plate and said transmission gear are arranged such that they are engaged with each other as said selector plate moes vertically at least before said selector rods have passed through said holes of said rotary board and are not engaged with each other when said rotary board rotates.

4,477,890

MAPPING DISC DEFECT DETECTOR

Donald G. Mooney, Orange, and Ludwig Ceshkovsky, Fountain Valley, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Filed Mar. 1, 1982, Ser. No. 353,740
Int. Cl.³ H04N *5/76*; G01N *21/32*; G11B *27/36*
U.S. Cl. 369—53 **5 Claims**



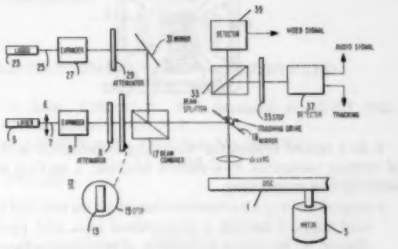
1. Apparatus for generating a map of detectable characteristics of a rotatable disc, comprising:
a scanning signal display device;
detecting means for examining a small fraction of the disc at a time, said detecting means generating a first electrical signal coupled to the intensity input of said scanning signal display device, said signal being representative of a detected characteristic of the disc in the fraction of the disc being examined;
scanning means for moving the disc relative to said detecting means such that said detecting means examines the disc in a spiral pattern, said scanning means including a spindle for holding the disc, means for rotating said spindle, and means for translating said spindle relative to said detecting means;
pulse generator means for generating a rotation pulse signal each complete rotation of said spindle;
variable signal means for generating a translation signal which varies in accordance with the translational position of said spindle; and
function generator means coupled to said pulse generator means and to said variable signal means for generating a first sinusoidal output signal and a second sinusoidal output signal, each at a frequency proportional to the frequency of said rotational pulse signal and each having an amplitude proportional to the value of said translation signal, said signals differing in phase by 90°, said first and said second sinusoidal output signals being coupled to said scanning signal display device such that the trace of said device follows a spiral pattern corresponding to the position of said detecting means relative to the disc.

4,477,891

MULTI-BANDWIDTH OPTICAL PLAYBACK APPARATUS HAVING MINIMUM BASEBAND DISTORTION

Istvan Gorog, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,595
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—109 **4 Claims**



1. In an optical playback system for recovering data from a disc-shaped storage medium, said data being recorded on a surface of said storage medium along the length of a spiral information track and including data recorded within a first given band of low frequencies and data recorded within a second given band of high frequencies, said information track having a succession of undulations representative of said data along the length thereof, said undulations having a first given range of spatial wavelengths corresponding to said first given band of frequencies and having a second given range of spatial wavelengths corresponding to said second given band of frequencies, and apparatus comprising:
a first light source, said light source emitting a first beam of radiation of a first given wavelength;
a second light source, said light source emitting a second beam of radiation of a second given wavelength, said second given wavelength being shorter than said first given wavelength;
means for combining said first and second beams of radiation to form a single beam path extending from said combining means to said surface of said record medium;
an objective lens, positioned in said single beam path, for focusing said beams of radiation to respective spots on said information track;
first means, responsive to the interaction of the light spot formed from said second beam and the undulations of said first given band of low frequencies, for developing signals representative of said data recorded in said first given band;
second means, responsive to the interaction of the light spot formed from said first beam and the undulations of said second given band of high frequencies, for developing signals representative of said data recorded in said second given band;
means for directing said first beam such that said first beam is incident on said second means for developing and for

directing said second beam such that said second beam is incident on said first means for developing; and

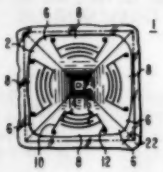
means, responsive to said first and second means for developing signals, for providing signals representative of said data recorded on said surface of said storage medium.

4,477,892

SURFACE ACOUSTIC WAVE DEVICE HAVING A PYRAMID SHAPED TIP FOR RECORDING VIDEO INFORMATION ON A SUBSTRATE

Soitiro Tosima, and Masayoshi Nishikawa, both of Machida, Japan, assignors to RCA Corporation, New York, N.Y.

Filed Jul. 13, 1982, Ser. No. 397,895
Int. Cl.³ G11B *3/44*; H04R *17/04*
U.S. Cl. 369—132 **10 Claims**



1. In a record system for recording information in the form of surface variations in a record medium, a surface acoustic wave device comprising:

a support having a pyramidal-shaped tip on one end thereof, said support having a longitudinal axis, said pyramidal-shaped tip including a plurality of polygon surfaces meeting at the apex of said pyramidal shape, said polygon surfaces being capable of supporting the propagation of surface acoustic waves;

a first fan-shaped electrode formed on a first surface of said plurality of polygon surfaces, said first fan-shaped electrode being coupled to a signal source and being provided for launching surface acoustic waves on said first surface, said surface acoustic waves launched from said first fan-shaped electrode in a first direction being focused at said apex;

a second fan-shaped electrode formed on a second surface of said plurality of polygon surfaces, said second fan-shaped electrode being coupled to said signal source and being provided for launching surface acoustic waves on said second surface, said surface acoustic waves launched from said second fan-shaped electrode in a second direction being focused at said apex; and

a cutting stylus positioned on said apex, said cutting stylus exhibiting vibratory motion in a direction parallel to said longitudinal axis in response to said surface acoustic waves focused at said apex.

4,477,893

TONE ARM DEVICE

Junichi Yoshio, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 173,249, Jul. 29, 1980, abandoned. This application Aug. 25, 1982, Ser. No. 411,382
Claims priority, application Japan, Jul. 30, 1979, 54-97932
Int. Cl.³ G11B *3/10*
U.S. Cl. 369—244 **8 Claims**

1. A tone arm device for a record turntable comprising:

a tone arm tube having means for receiving a stylus at one end thereof;

an inner moveable member rotatably supporting said tone arm tube for rotation about horizontal and vertical axes;

an outer moveable member freely moveable relative to said inner member;

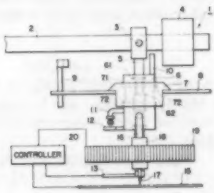
supporting means for rotatably supporting said outer moveable member;

first detecting means for detecting the position of said inner moveable member relative to said outer moveable member and providing a corresponding output signal;

second detecting means for detecting the position of said outer moveable member and providing a corresponding output signal;

control means operating to compare said output signal from said second detecting means with said output signal from said first detecting means for producing a drive signal;

drive means for driving said outer moveable member to track movement of said inner moveable member in accordance with said drive signal produced by said control means;



lifting means for rotating said tone arm tube about said horizontal axis to raise said one end of said tone arm tube and lower the opposite end thereof; and

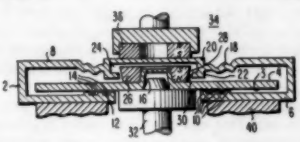
tone arm tube support means carried by said outer moveable member on the opposite side of said inner moveable member from said lifting means and having means for engaging said tone arm tube whereby upon rotation of said tone arm tube into engagement with said support means, manual rotation of said tone arm tube about said vertical axis in both directions will directly rotate said outer moveable member with said inner moveable member.

4,477,894

PROTECTIVE CARTRIDGE FOR DISC RECORD

Stanley P. Clurman, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 10, 1982, Ser. No. 406,883
Int. Cl.³ G11B *25/04*
U.S. Cl. 369—270 **10 Claims**



1. In a system for recovering or recording information signals, said information signals being recovered or recorded on a disc record, said system including rotatable support means for rotatably supporting said record, an apparatus comprising:

a cartridge having a chamber for enclosing said disc record;

said cartridge also having a cavity, a surface of said cavity having a conical shape; and

magnetic holding means for magnetically holding said disc

record against said rotatable support means, a surface of said magnetic holding means having a conical shape, said conical shape of said magnetic holding means being complementary to the conical shape of said cavity, said magnetic holding means being located within said cavity and arranged to move axially with respect to said disc record, said magnetic holding means being retained within said cavity by said cavity surface having a conical shape.

4,477,895

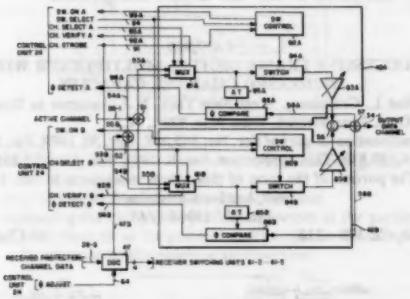
SYNCHRONIZED PROTECTION SWITCHING ARRANGEMENT

Paul W. Casper; James W. Toy, both of Melbourne; Fred J. Orlando, Jr., West Melbourne, and Ronald R. Giri, Melbourne, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 146,340, May 2, 1980, abandoned. This application Nov. 10, 1981, Ser. No. 319,999

Int. Cl.³ H04B *1/74*

U.S. Cl. 370—16 **22 Claims**



1. For use in a communication system having first and second data links over which data signals may be conveyed to a receiving date output port, an arrangement for controlling the connection of one of said first and second data links to said receiving data output port in place of the other of said first and second data links comprising first and second controlled switching circuits, each having first and second inputs coupled to said first and second data links and an output coupled to said output port, each of said controlled switching circuits including:

first means for selectively providing a signal coupling path for signals applied to one of said first and second inputs to said output port;

second means, coupled to the signal coupling path providing by said first means, for delaying signals applied to said one of said first and second inputs;

third means for comparing the timing relationship between data signals appearing at said output port and signals delayed by said second means; and

fourth means, responsive to an output of said third means, for controlling the selective provision of a signal coupling path for signals applied to one of said first and second inputs to said output port.

4,477,896

SINGLE-WIRE DATA TRANSMISSION SYSTEM HAVING BIDIRECTIONAL DATA SYNCHRONIZATION, AND D.C. POWER FOR REMOTE UNITS

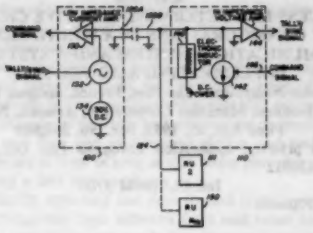
Eric M. Aker, 34 Lodge Rd., Newton, Mass. 02165

Filed Oct. 2, 1981, Ser. No. 307,786

Int. Cl.³ H04B *1/56*

U.S. Cl. 370—24 **15 Claims**

1. The method of communicating in one direction in the form of current modulated signals and in the opposite direction in the form of voltage modulated signals and wherein cross-talk between signals is minimized by preventing changes in the signals from being present simultaneously; and wherein cross-talk is further minimized by fixing the rate of change of voltage



per unit time, $dv/_{dt}$ within a predetermined range such that the current induced by $dv/_{dt}$ is much less than the amplitude of the current modulations.

4,477,897

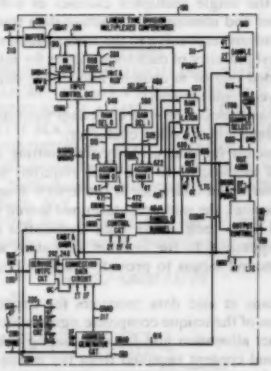
LINEAR TIME DIVISION MULTIPLEXED CONFERENCER

Michael S. Lane, Colts Neck, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 24, 1982, Ser. No. 391,697

Int. Cl.³ H04M *3/56*

U.S. Cl. 370—62 **8 Claims**



1. A circuit for accepting message samples at an input, said message samples arriving in time slots within a frame, said circuit comprising

means for selectively summing said message samples from groups of said time slots,

first storage means having a plurality of memory locations for storing each said summed message samples accepted during a first time frame and for supplying said stored summation during a next second time frame,

second storage means having a plurality of memory locations for storing each said summed message samples accepted during said next second time frame and for supplying said stored summation during a next third time frame,

means for selectively fetching from said first or second storage means priorly stored summed message samples, wherein said message summing means includes means for combining message samples received with respect to any time slot of a group of time slots with said fetched priorly stored summed message samples respective to said group,

means for recoginizing during each frame the first occurring time slot in each of said groups of time slots, and

means controlled by said recognizing means for controlling said storage of said summed message samples.

4,477,898

PROCESS FOR DETERMINING ACTIVE CHANNEL CONFIGURATIONS IN A MULTIPLEX COMMUNICATIONS SYSTEM AND A SYSTEM FOR IMPLEMENTING SAID PROCESS

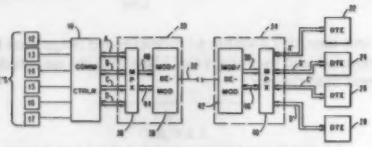
Jean Cholat-Namy, Juan Les Pins, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 15, 1982, Ser. No. 368,600

Claims priority, application European Pat. Off., Apr. 30, 1981, 81430012

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—80 **5 Claims**



1. A multiplex data transmission system for connecting a first plurality of data transmitters each exclusively to one of a second plurality of data receivers via a single multiplex channel comprising:

first means for receiving data signals from each of the data transmitters and adaptively multiplexing the data signals onto the single multiplex channel as a function of the number and identity of the active data transmitters,

second means responsive to the transmission requirements of the first plurality of data transmitters for selecting a predetermined one of m channel allocations depending on the received requirements,

third means associated with each data transmitter for storing a predetermined coded character,

fourth means for concurrently transmitting for a predetermined time equal to the time required to transmit the predetermined character at the lowest speed allocated on the channel, the said predetermined stored character associated with each active data transmitter each at a rate corresponding to the channel allocation selected by the said second means to provide a unique composite signal, and

fifth means at said data receivers for decoding at least a portion of the unique composite signal which identifies the channel allocation and for distributing subsequent informational content received from the multiplex channel in accordance therewith to the second plurality of data receivers.

4,477,899

DIGITAL DATA TRANSMISSION SYSTEM WITH TIME DIVISION/PACKET TRANSFORMATION FUNCTION

Takao Kato, Yokohama, and Tetsuo Takemura, Kamakura, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1982, Ser. No. 368,661

Claims priority, application Japan, Apr. 17, 1981, 56-57217

Int. Cl.³ H04J *3/00*

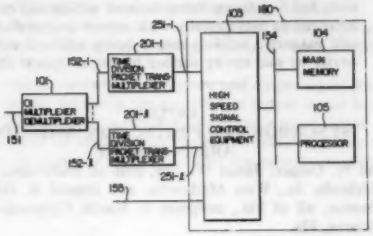
U.S. Cl. 370—94 **6 Claims**

1. A digital data transmission system comprising:

a time division multiplex line;

a packet multiplex line; and

a transmultiplexer connected between the time division multiplex line and the packet multiplex line, said transmultiplexer receiving data on said time division multiplex line in which data for a plurality of terminals is serially and periodically allocated every predetermined number of bits in a predetermined sequence of the terminals, delivering out data on said packet multiplex line in which the data for the plurality of terminals received from said time division multiplex line is converted into a plurality of units of a packet and allocating, before or behind the packet on the



packet multiplex line, a specific packet containing information regarding the sequence of the terminals relating to said packet on said time division multiplex line.

4,477,900

SUCCESSIVE FRAME DIGITAL MULTIPLEXER WITH INCREASED CHANNEL CAPACITY

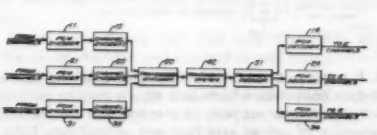
Elliot L. Gruenberg, West New York, N.J., assignor to Broad-Com, Incorporated, West New York, N.J.

Continuation-in-part of Ser. No. 145,348, Apr. 30, 1980, Pat. No. 4,339,818. This application Jun. 8, 1981, Ser. No. 271,231

The portion of the term of this patent subsequent to Jul. 13, 1999, has been disclaimed.

Int. Cl.³ H04J *3/18*

U.S. Cl. 370—112 **16 Claims**



1. A digital communications system comprising a plurality of input channels for carrying information signals, means associated with each input channel for serially encoding the information signals into a sequence of multibit digital words, timing means, controlling each of the encoding means, for ordering the bit position of each multibit digital word such that a predetermined bit in each word is presented at different times to outputs of each of the encoding means, first means for converting the multibit digital words from each of the encoding means into multibit digital code words, means for multiplying each bit of each code word with a different analog voltage, means for summing the multiplied different analog voltages, second means for converting the summed analog voltage into transmission code words, means for ordering the transmission code words into a plurality of successive transmission frames and means for transmitting the successive transmission frames over a communications highway to a remote location.

4,477,901

DIRECTIVE DIAGNOSTICS

Edward C. Braband, Penfield, and Frank R. Walsh, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1981, Ser. No. 323,783

Int. Cl.³ G06F *11/22*

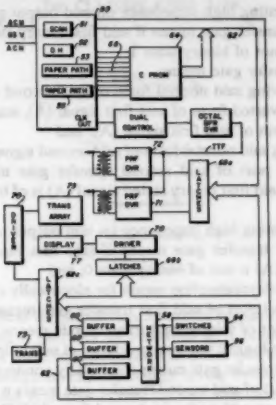
U.S. Cl. 371—15 **14 Claims**

1. In a machine having a plurality of subsystems, each of the subsystems being divided into a plurality of processing events, the processing events being a sequence of operations related to specific hardware components in the subsystem for controlling

machine operation, a controller, and a control panel for use in machine diagnostics, a method of diagnosing operation of the machine comprising the steps of:

continuously monitoring each completed processing event in each subsystem,

recognizing a machine malfunction in any of the subsystems,



identifying the particular subsystem manifesting the malfunction,

responding to the machine malfunction and

indicating the completed processing events in the particular subsystem up to the point of malfunction in the subsystem in response to the machine malfunction.

4,477,902

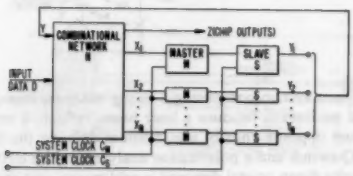
TESTING METHOD FOR ASSURING AC PERFORMANCE OF HIGH PERFORMANCE RANDOM LOGIC DESIGNS USING LOW SPEED TESTER

Prem Puri, Manassas, and Yogi K. Puri, Vienna, both of Va., assignors to IBM Corporation, Armonk, N.Y.

Filed Jun. 18, 1982, Ser. No. 389,820

Int. Cl.³ G06F *11/00*; G01R *31/28*

U.S. Cl. 371—25 **8 Claims**



1. A method for functionally testing high performance random logic having a first periodic cycle time, with a tester having a second periodic cycle time which is longer than said first cycle time, said random logic including a combinational logic network having a testing input connected to the output of said tester and a feedback input, and an output, said random logic further including a master latch having a data input connected to said output of said combinational logic network, a first enabling clock input and a data output, said random logic further including a slave latch having a data input connected to said data output of said master latch, a second enabling clock input and a result output connected to the input of said tester and connected to said feedback input of said combinational logic network, said first enabling clock input having a first input waveform thereat with a first up level duration which does not overlap with a second up level duration of a second input waveform at said second enabling clock input, the trailing edge of said first waveform preceding the beginning edge of said second waveform by at least a first delay and the trailing edge of said second waveform preceding the beginning edge of said first waveform by at least a second delay, the method comprising the steps of:

increasing the duration between said trailing edge of said second waveform and said beginning edge of said first waveform to be a constant value plus said second delay so that the sum of said first and said second up level durations and said first and said second delays and said constant value are at least as long as said tester periodic cycle time, during a first testing phase;

periodically inputting test data to said testing input of said combinatorial logic network from said tester and periodically outputting test result data from said result output to said tester, with said second periodic cycle time during said first testing phase to test said master latch;

increasing the duration between said trailing edge of said first waveform and said beginning edge of said second waveform to be said constant value plus said first delay, during a second testing phase;

periodically inputting test data to said testing input of said combinatorial logic network from said tester and periodically outputting test result data from said result output to said tester, with said second periodic cycle time during said second testing phase to test said slave latch and said combinational logic network;

whereby a tester with a relatively slow cycle time can test high performance random logic with a relatively faster cycle time.

4,477,903

ERROR CORRECTION METHOD FOR THE TRANSFER OF BLOCKS OF DATA BITS, A DEVICE FOR PREFORMING SUCH A METHOD, A DECODER FOR USE WITH SUCH A METHOD, AND A DEVICE COMPRISING SUCH A DECODER

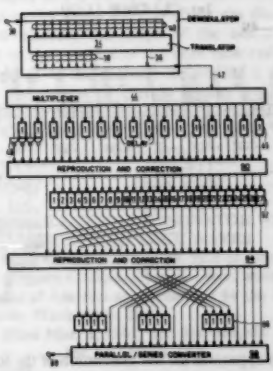
Kornelis A. Schouhamer Immink, and Lodewijk B. Vries, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,940

Claims priority, application Netherlands, Jan. 21, 1982, 8200207

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—37 **16 Claims**



1. An error correction method for the transfer of word-wise data comprising the steps of:

a. receiving a first number of data words in a first error encoder in order to add thereto a first series of parity

words on the basis of a first generator matrix of a first word correction code;

b. delaying said first numbers of data words and first series of parity words by delay times which are all different within each first number and associated first series in order to interleave said words so as to form as many second numbers of words;

c. receiving said second number of words in a second error encoder in order to add thereto a second series of parity words on the basis of a second generator matrix of a second word correction code so as to form a third number of words;

d. word-by-word modulation of said serially linked third numbers of words in order to form channel words which satisfy, by way of added redundancy, predetermined upper limits and lower limits for the admissible intervals between directly successive signal transitions, said channel words being pair-wise separated by merging bits which also satisfy said upper limits and lower limits in conjunction therewith;

e. demodulation of the channel words and merging bits after the transfer in order to reconstruct said third number of words (34);

f. reproducing and, if possible and necessary, correcting said second numbers of words (50) on the basis of the second parity check matrix associated with the second generator matrix;

g. de-interleaving (52) said second numbers of words, followed by the reproducing and, if possible and necessary, correcting of said first numbers of data words for a user (54) on the basis of the first parity check matrix associated with the first generator matrix; characterized in that

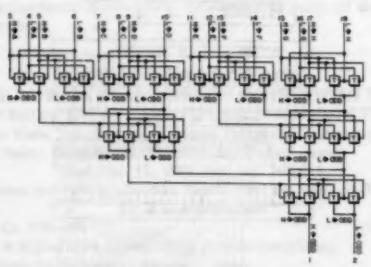
h. during the demodulation a first flag bit is added to the word of said third number of words which is formed from an irrecognizable channel word, a second flag bit being added (114) to each word of the relevant second number of words during reproduction of a said second number of words on the basis of the second parity check matrix, under the control of an excessive number of first flag bits (116) within a said third number, in order to indicate the relevant second number of words as being generally unreliable.

4,477,904

PARITY GENERATION/DETECTION LOGIC CIRCUIT FROM TRANSFER GATES

Lee T. Thorsrud, Saint Paul, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,804
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—49 **4 Claims**



1. A circuit apparatus for the generation of the logical parity resultant between two binary stated (0 or 1) signals (A and B) each of which is received by said circuit apparatus in both normal (A, B) and inverted ($\overline{A}$, $\overline{B}$) form, said parity generating circuit comprising:

first transfer gate means

for receiving said inverted form of said second ($\overline{B}$), said normal form of said first signal (A), and said inverted form of said first signal ($\overline{A}$), and

for gating said inverted form of said second signal ($\overline{B}$) to an output port of said first transfer gate means only when said first binary stated signal (A) is of binary state 1, else

for presenting high impedance on said output port of said first transfer gate means if said first binary stated signal (A) is not of binary state 1;

second transfer gate means

for receiving said normal form of said second signal (B), said inverted form of said first signal ($\overline{A}$), and said normal form of said first signal (A), and

for gating said normal form of said second signal (B) to an output port of said second transfer gate means only when said first binary stated signal (A) is of binary state 0, else

for presenting high impedance on said output port of said second transfer gate means if said first binary stated signal (A) is not of binary state 0; and

wired-OR interconnection means for electrically connecting said output port of said first transfer gate means and said output port of said second transfer gate means;

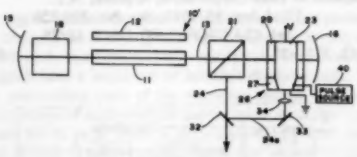
whereby the logical function produced at said output port of said first transfer gate means electrically connected to said output port of said second transfer gate means is the exclusive OR, or odd parity in normal form (ODD), or even parity in inverted form ($\overline{\text{EVEN}}$) between said two binary stated signals (A and B).

4,477,905

SHORT PULSE LASER

Harold E. Sweeney, Menlo Park, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 5, 1982, Ser. No. 432,847
Int. Cl.³ H01S *3/10*
U.S. Cl. 372—25 **4 Claims**



1. In a laser system comprising a lasing medium, means to pump said medium to produce a laser beam, reflective means spaced from opposite ends of said medium defining the laser cavity, a Q-switch and a polarization analyzer and an electro-optical cavity dump crystal disposed in said cavity, said crystal having an electrode thereon, and means to apply a voltage to said electrode, the improvement of means to discharge said voltage across said crystal to change the polarization of said laser beam and cause said analyzer to direct said beam as an output pulse from said cavity, comprising

a semiconductor body adjacent to said crystal and having an electrode connected to said crystal electrode,

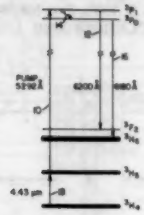
said body electrode having first and second parts separated by a gap, and

a negative-pulse means causing said crystal and said analyzer to direct part of said output beam against said semiconductor body at said gap to generate electrons in said semiconductor body and electrically connect said electrode parts together to regeneratively accelerate discharge of said voltage across said crystal and produce a narrow output pulse.

4,477,906
METHOD AND APPARATUS FOR POPULATION INVERSION

William E. Case, Arlington, Tex., assignor to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Apr. 20, 1982, Ser. No. 370,174
Int. Cl.³ H01S 3/091, 3/16
U.S. Cl. 372—41 63 Claims



1. A method for population inversion comprising:

supporting a plurality of electrons in a bounded volume, each of the electrons located at a site and having at least four energy levels, the energy levels including a ground level and first and second excited state levels, with substantially equal energy spacing between the ground level and the first excited state level and between the first and second excited state levels, and having energy transfer effected between electrons on neighboring sites; and

pumping the electrons from one of the excited state energy levels on a first site to the highest energy level at the first site, such that subsequent decay of the excitation provides emission of photons and such that energy transferred between the first site and a second site induces a population of the excited state levels at the first and second sites.

4,477,907
LOW POWER ARGON-ION GAS LASER

William H. McMahan, Salt Lake City, Utah, assignor to American Laser Corporation, Salt Lake City, Utah

Filed May 3, 1982, Ser. No. 374,472
Int. Cl.³ H01S 3/03
U.S. Cl. 372—64 10 Claims

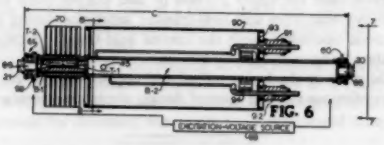


FIG. 6

1. A gas laser, comprising:

(a) an active gaseous medium;

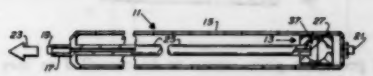
(b) excitation means for exciting said active medium to produce optical laser radiation; and

(c) an optical resonator confining said active medium, said optical resonator including optical means for effecting multiple reflections of optical laser radiation through said medium as a beam having a predetermined envelope, said resonator forming a plasma guide structure having a plasma guide tube with a first bore of selected diameter, said plasma guide structure having in axial alignment with and as a continuation of said first bore, a second bore of greater diameter than said first bore, the optical properties of said beam and the geometrical properties of said bores in conjunction with the current densities established within said bores being such that the portion of said beam envelope occupying said first bore substantially fills said first bore and said optical laser radiation is generated substantially entirely in said first bore.

4,477,908
COLD CATHODE CONSTRUCTION

Shinan-Chur Sheng, and Joseph B. Lastovka, both of Sunnyvale, Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Mar. 12, 1982, Ser. No. 357,501
Int. Cl.³ H01S 3/02
U.S. Cl. 372—88 1 Claim



1. An axially elongated, cold cathode gas laser of the kind in which ionized species are accelerated against a cathode to eject electrons from the cathode for producing a gas discharge within a gas discharge confinement tube which has an end positioned adjacent the cathode, said gas laser comprising,

an axially elongated outer tube filled with a gas mixture and end mirrors associated with the outer tube for providing a resonant cavity,

a single anode at one end of the tube,

a single, axially compact cathode at the other end of the tube and spaced from the anode by an axial distance substantially greater than the axial length of the cathode,

said cathode having a first opening for a bore tube and a second opening for enabling a laser beam to pass through the cathode to a reflecting mirror of the laser,

a gas discharge confinement bore tube extending between the anode and the cathode and having one end projecting through the first opening in the cathode,

electrical field means effective to drive ionized species against the cathode to eject electrons from the cathode and to produce a light emitting gas discharge within said bore tube,

said cathode having active surface means constructed for balancing the trapping rate and the releasing rate of gas particles in the cathode to maintain a substantially constant gas pressure during the operating life of the gas laser, said active surface means comprising a substantially spherically shaped active surface which forms a substantially reentrant cavity about the end of the gas discharge bore tube and wherein the shape of the active surface is matched to the position of the bore tube end and to the two openings in the cathode to provide a substantially uniform distribution of current density over the active surface during the operation of the gas laser.

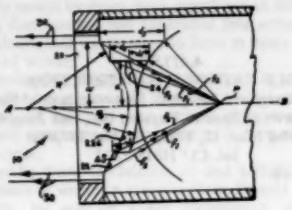
4,477,909
UNSTABLE OPTICAL RESONATOR WITH CANCELLING EDGE WAVES

Theodore C. Salvi; Martin E. Smithers, both of Albuquerque, N. Mex., and Gregory C. Dente, Bethel, Conn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 2, 1982, Ser. No. 353,981
Int. Cl.³ H01S 3/08
U.S. Cl. 372—95 8 Claims

1. In an unstable optical resonator having an optical axis, an output mirror with an internal surface, and a virtual geometric point source at a location along said optical axis, the improvement within said unstable optical resonator comprising means in the form of a structural discontinuity incorporated on said

internal surface of said output mirror for causing interfering edge waves travelling from said output mirror toward said



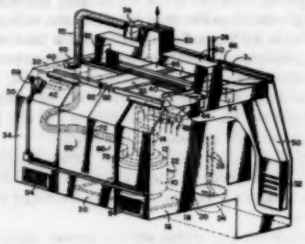
virtual geometric point source to be cancelled as they approach said virtual geometric point source.

4,477,910

FUMES CONTROL SYSTEM FOR ELECTRIC ARC FURNACES

Pramodh Nijhawan, Winston-Salem, and Eugene D. Schaltenbrand, Clemmons, both of N.C., assignors to The Bahnson Company, Winston-Salem, N.C.

Filed Apr. 7, 1983, Ser. No. 482,912
Int. Cl.³ F27D 17/00
U.S. Cl. 373—9 9 Claims



1. For a furnace having a first support, a tiltable, top-chargeable furnace vessel mounted on said first support, means for charging said furnace vessel at a charging site adjacent said furnace, said furnace having a tapping site adjacent said furnace, means for tapping said furnace at said tapping site, a second support contiguous with said first support, means adapted to overlie said second support at said tapping site for collecting melted and refined metals from said furnace vessel, and furnace controls for said charging means and said tapping means, a fumes control system comprising:

(a) a housing covering the top and sides of said furnace in sealing engagement with said first and second supports, and adapted to entirely enclose said furnace and collecting means, said housing having an upper area defining a clear space overlying said furnace;

(b) a first exhaust means having an inlet in said clear space proximate the upper area of said housing and having a first control damper associated therewith;

(c) a second exhaust means having an inlet within the housing adjacent to said tapping site and having a second control damper associated therewith;

(d) a common discharge means connected to said first and second exhaust means; and

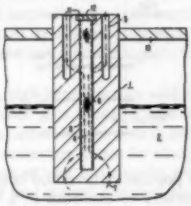
(e) control means coupled to said furnace controls and interconnecting said first and second control dampers to open said first exhaust means and throttle said second exhaust means during charging and to throttle said first exhaust means and open said second exhaust means during tapping, whereby said common discharge means may operate continuously to exhaust fumes from the respective sites alternately.

4,477,911

INTEGRAL HEAT PIPE-ELECTRODE

Daniel J. Racki, Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 2, 1982, Ser. No. 446,151
Int. Cl.³ H05B 3/60, 3/78
U.S. Cl. 373—36 11 Claims



1. An electrode for conducting electrical energy to heat a molten material bath, and heat pipe cooling means forming a part of said electrode, said electrode comprising:

an elongated copper body having one lower end thereof adapted to be immersed in said molten bath, and the other upper end of said elongated copper body adapted to project above said molten bath;

an axially extending and elongated aperture provided in said elongated copper body and terminating within said copper body proximate said one lower end of said copper body, said aperture being sealed proximate said other upper end of said copper body, and a filling within said aperture comprising heat-transfer substance;

a vapor-deposited thin metallic layer which is non-reactive with said heat-transfer substance carried on all copper surfaces of said aperture, and a non-reactive metallic mesh extending within said aperture to act as a capillary for said heat-transfer substance during operation of said electrode; and

cooling means comprising a water-cooled jacket positioned proximate the upper portion of said copper body to remove heat from said heat-transfer substance during electrode operation, with the cooled heat-transfer substance then being conveyed by said non-reactive capillary metallic mesh to the lower end of said copper body to effect a continuous cooling thereof during electrode operation.

4,477,912

CORRELATION DATA COMMUNICATIONS SYSTEM

James L. Russell, Germantown, Md., assignor to Arinc Research Corporation, Annapolis, Md.

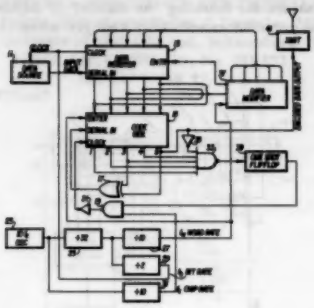
Filed Feb. 12, 1982, Ser. No. 348,425
Int. Cl.³ H04K 1/04
U.S. Cl. 375—1 31 Claims

15. An encoding system for transmitting digital code data comprising:

means for receiving k-bit data words;

means for generating from a received k-bit data word, a selected one of a plurality of n-bit pseudorandom code sequences which is assigned to said received k-bit data word and for adding to said selected pseudorandom code sequence at least one additional binary bit to produce a pseudorandom code word which contains an even number

of data bits, half of which are of ones and half of which are zeros; and



means for tansmitting said pseudorandom code word at a predetermined chipping frequency to a receiver.

4,477,913
AUTOMATIC EQUALIZER APPARATUS

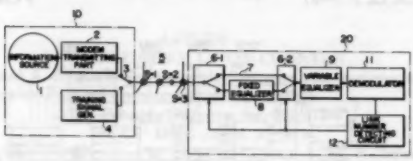
Masahiro Koya, Los Angeles, Calif.; Narimichi Maeda, Tachikawa, Japan; Kohei Ishizuka, Hachioji, Japan; Kazuhiko Takaoka, Tokyo, Japan; Yoshiro Kokuryo, Kodaira, Japan, and Yasuhiro Kita, Hachioji, Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Apr. 15, 1982, Ser. No. 368,664

Claims priority, application Japan, Apr. 17, 1981, 56-57141

Int. Cl.³ H04B *3/14*

U.S. Cl. 375—13 **7 Claims**



1. An automatic equalizer apparatus comprising:

a circuit for detecting from a received signal the number of the carrier-band lines in a transmission line, said received signal having passed through said transmission line;

a fixed equalizer; and

a control circuit for controlling an operation as to whether said fixed equalizer is connected in front of a receiving MODEM or not, on the basis of an output signal from said circuit for detecting the number of carrier-band lines.

4,477,914
ADAPTIVE EQUALIZER

James A. Murray, Sawbridgeworth, and David Nyman, New Barnet, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,835

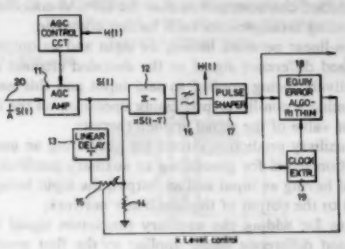
Claims priority, application United Kingdom, Feb. 10, 1981, 8104087

Int. Cl.³ H04B *3/14*

U.S. Cl. 375—14 **4 Claims**

1. An adaptive delay equalizer for use in the reception of intelligence conveyed as pulses in pulse-modulation form comprising:

means for receiving said pulses, means for delaying each of said pulses; means for equalizing said pulses by reducing the delayed pulse in amplitude by a variable amount and subtracting the reduced delayed pulse from the unreduced undelayed pulse, so that the amount of the time delay and the amount of the amplitude reduction is such that any



distortion present at the trailing edge of the pulse is substantially reduced or eliminated.

4,477,915
DIFFERENTIAL PULSE CODE MODULATION TRANSMISSION SYSTEM

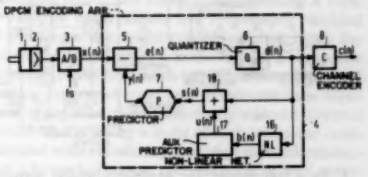
Joseph H. Peters, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1982, Ser. No. 447,085

Claims priority, application Netherlands, Oct. 13, 1982, 8203950

Int. Cl.³ H03K *13/22*

U.S. Cl. 375—30 **6 Claims**



1. A differential pulse code modulation (DPCM) transmission system comprising a transmitter and a receiver,

A. the transmitter comprising:

a1. means for generating an information signal to be transmitted;

a2. a DPCM encoding arrangement comprising:

aa1. a difference producer to which there are applied via a first input the information signal to be transmitted and via a second input a first prediction signal for generating a difference signal;

aa2. a quantizing arrangement to which the difference signal is applied and which produces a quantized difference signal;

aa3. a first prediction circuit for generating the first prediction signal and having an input to which the quantized difference signal is applied, also having an output coupled to the second input of the difference producer;

a3. a channel encoding circuit for converting the quantized difference signal into a digital channel signal;

B. the receiver comprising:

b1. a channel decoding circuit for converting the rereceived digital channel signal into a decoded channel signal;

b2. a DPCM decoding arrangement comprising:

bb1. a sum producer to which the decoded channel signal is applied via a first input and a second prediction signal via a second input;

bb2. a second prediction circuit for generating the second prediction signal and having an input to which the

decoded channel signal is applied, also having an output coupled to the second input of the sum producer;

b3. means for processing the sum signal produced by the sum producer, characterized in that the DPCM encoding and decoding arrangements each further comprise:

C1. a non-linear network having an input and an output, the quantized difference signal or the decoded channel signal, respectively, being applied to said input and this network performing a non-linear processing operation on the instantaneous value of the signal applied thereto;

C2. an auxiliary prediction circuit for generating an auxiliary prediction signal for generating an auxiliary prediction signal and having an input and an output, the input being connected to the output of the non-linear network;

C3. means for adding the auxiliary prediction signal to the quantized difference signal applied to the first prediction circuit and to the decoded channel signal applied to the second prediction circuit, respectively.

4,477,916

TRANSMITTER FOR ANGLE-MODULATED SIGNALS

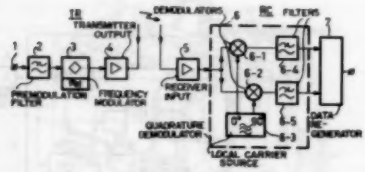
Kah-Seng Chung, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 11, 1982, Ser. No. 357,245

Claims priority, application Netherlands, Apr. 1, 1981, 8101611

Int. Cl.³ H03K *25/49*

U.S. Cl. 375—60 **3 Claims**



1. In a transmitter for angle-modulated signals having an input for synchronous binary signals, a premodulation filter connected to said input, and a frequency modulation arrangement connected to the output of the filter and serving to provide, in response to an input signal voltage, and output signal at a frequency which linearly depends on the amplitude of said input signal voltage; the improvement wherein the premodulation filter has a pulse response h(t) in accordance with the expression:

$$h(t) = g(t) - \sum_{n=1}^{N} a(n)[g(t - nT) + g(t + nT)],$$

wherein g(t) is the pulse response of a Gaussian low-pass filter, T is a delay time equal to the duration of a binary signal element and n is an integer.

4,477,917

DIGITAL DISDROMETER

Denis P. Donnelly, Saratoga Springs, N.Y., assignor to Siena College, Loudonville, N.Y.

Filed Mar. 26, 1981, Ser. No. 247,940

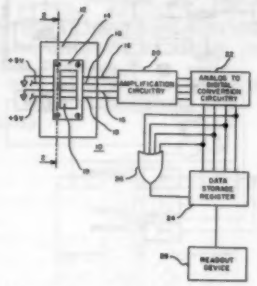
Int. Cl.³ G01N *27/00*

U.S. Cl. 377—11 **10 Claims**

1. A disdrometer for measuring the size of moving electrically conductive liquid drops comprising:

a plurality of sensing wires of preselected thickness arranged in a premeasured, equally spaced-apart, parallel relationship with one another in a plane transverse to the path of the moving drops, each wire being maintained at an electric potential difference with respect to its adjacent wires; and

circuit means for counting the number of adjacent wires whose potential momentarily changes when electrically



connected to one another by a passing drop, thereby the numbers counted by said circuit means is used to mathematically determine, within predetermined limits, the size range of the drop connecting the wires.

4,477,918

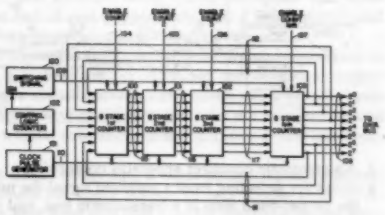
MULTIPLE SYNCHRONOUS COUNTERS WITH RIPPLE READ

Steve J. Nossen, Somerset, N.J.; Stanley S. Brokl, Altdena, and Kenyon E. B. McGuire, San Diego, both of Calif., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 13, 1981, Ser. No. 310,854

Int. Cl.³ H03K *21/34, 21/16*

U.S. Cl. 377—37 **4 Claims**



1. A system for reading out the contents of multiple counters onto the leads of a common bus comprising:

a plurality of first to Mth synchronous binary counters with each counter having N corresponding stages, each having an output terminal on which appears the contents of said stage, an input terminal, and a clock pulse input terminal, with each stage responsive to a clock pulse supplied to its clock pulse input terminal to transfer the signal logic level on its input terminal to its output terminal and with the output terminals of the corresponding stages of Mth counter comprising said common bus;

clock pulse generating means for supplying clock pulses simultaneously to all of said clock input terminals;

means for generating a switching pulse;

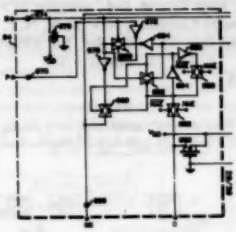
switching means responsive to said switching pulse for connecting said output terminal of each stage simultaneously and in parallel to the input terminal of the corresponding stage of the next adjacent counter in said ring of counters and including the connections of the output terminals of the corresponding stages of the Mth binary counter to the input terminals of the corresponding stages of said first synchronous binary counter.

4,477,919

RANGE CONTROL CIRCUIT FOR COUNTER TO BE USED IN A FREQUENCY SYNTHESIZER

Jaime A. Borras, Hialeah, and Ruben J. Gonzalez, Miami, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 6, 1981, Ser. No. 251,572
Int. Cl.³ H03K 21/36
U.S. Cl. 377—47 8 Claims



1. A range control circuit for a counter counting regularly occurring pulses comprising:

counting means containing a plurality of stages being responsive to a source of regularly occurring pulses;

memory means containing a counter state and information indicative of a range change; and

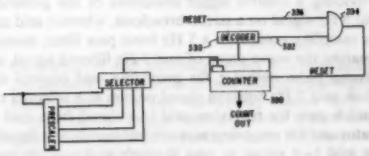
external programming means responsive to information in said memory means indicative of a range change to enable predetermined stages of said counter, thereby changing its range and allowing said counter to reach a state that is outside of the range of the maximum value storable in said memory means for presetting said counting means.

4,477,920

VARIABLE RESOLUTION COUNTER

Richard A. Nygaard, Jr., Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 26, 1982, Ser. No. 352,673
Int. Cl.³ H03K 21/34, 21/36
U.S. Cl. 377—52 4 Claims



1. A variable resolution counter for counting events indicated by an input signal, comprising:

prescaler means for providing a plurality of scaled signals in response to said input signal;

counter means for incrementing a value in response to a first signal, and for providing a second signal indicative of a preselected set of the most significant digits of said value;

count output means, for providing a count out signal to permit sampling of said value; and

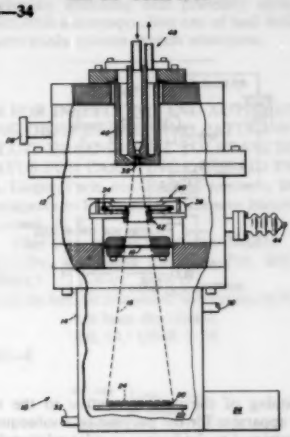
selector means connected to the prescaler means and the counter means, for selecting said first signal from one of the plurality of scaled signals, in response to said second signal.

4,477,921

X-RAY LITHOGRAPHY SOURCE TUBE

Anthony J. Armini, Bedford, and Wallace S. Kreisman, Malden, both of Mass., assignors to Spire Corporation, Bedford, Mass.

Filed Nov. 27, 1981, Ser. No. 325,286
Int. Cl.³ G21K 5/00
U.S. Cl. 378—34 9 Claims



1. In an X-ray lithography source tube of the type comprising an electron beam source and a target for generating X-rays, wherein the electron beam source is a ring-shaped shielded cathode and the target is a water-cooled inverted cone: the improvement in which said target is in the form of a composite target cone comprising at least an X-ray generating layer and a water-interface layer; wherein said water-interface layer includes a layer of high thermal conductivity material covered at said water-interface layer by a layer of high corrosion resistance material; and wherein said layer of high thermal conductivity material is formed of copper and said layer of high corrosion resistance material is formed of palladium.

4,477,922

TOMOGRAPHIC X-RAY APPARATUS FOR THE PRODUCTION OF TRANSVERSE LAYER IMAGES

Reiner Liebetruth, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

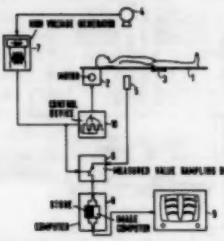
Continuation of Ser. No. 053,263, Jun. 29, 1979, , which is a continuation of Ser. No. 775,452, Mar. 8, 1977, Pat. No. 4,174,481. This application Nov. 12, 1981, Ser. No. 320,737
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613809
The portion of the term of this patent subsequent to Nov. 13, 1996, has been disclaimed.
Int. Cl.³ G03B 41/16
U.S. Cl. 378—20 8 Claims

1. The method of aligning a patient with respect to tomographic x-ray apparatus which includes an x-ray tomographic scanner apparatus for scanning a patient transverse layer from successive angular positions about said layer so as to provide a computer constructed tomographic image thereof, said method comprising:

(a) moving a patient longitudinally relative to the scanner apparatus while the scanner apparatus is restricted to a single relationship such that the patient is scanned from the single angular relationship only but at successive longitudinal positions offset from each other longitudinally of the patient, and

(b) storing respective sets of readings from the scanner apparatus for the successive longitudinal positions thereby to

provide the data for a graphic display wherein the sets of reading are the basis for successive lines of varying visual characteristics on the display, the stored sets of readings thereby defining a general radiographic view representing a longitudinally extensive image useful in the precise



positioning of the patient relative to the tomographic x-ray apparatus for the purpose of a subsequent scanning not restricted to the limited angular relationship but relating to a transverse layer having greatly restricted longitudinal extent.

4,477,923

X-RAY DIAGNOSTIC SYSTEM FOR ANGIOGRAPHIC RADIOGRAPHS

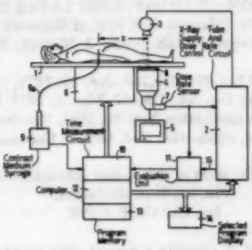
Heinz Baumann, Uttenreuth, and Hans-Jürgen Gerlach, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,315

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1982, 3203594

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—95 **6 Claims**



1. An x-ray diagnostic system for angiographic radiographs, comprising a patient support, an x-ray tube , arranged on one side of the support, an x-ray high voltage generator supplying said x-ray tube, an x-ray image intensifer, arranged on the other side of the support, a television chain connected with the x-ray image intensifier, a control loop for controlling the mean brightness, and a syringe for contrast medium injection, characterized by a time measuring means, capable of being started by the syringe, an evaluation unit coupled with the time measuring means and operable for signalling the time measuring means when the mean image brightness varies to a predetermined extent, and characterized by a computer means for the determination of the contrast medium velocity from the measured time and from the distance between the injection location and the measuring location.

4,477,924

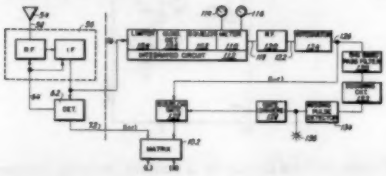
AM STEREO DETECTOR

Ernest F. Close, Fort Wayne, Ind., assignor to Magnavox Consumer Electronics Company, New York, N.Y.

Filed Dec. 28, 1981, Ser. No. 335,090

Int. Cl.³ H04H *5/00*

U.S. Cl. 381—15 **4 Claims**



1. In an AM stereo receiver suitable for receiving an AM/PM modulated RF carrier frequency which also includes a 5 Hz subaudible tone which is FM modulated on top of the RF carrier when said RF carrier carries a stereo broadcast and which receiver provides an AM/PM intermediate frequency and includes a standard AM detector which receives said AM/PM modulated intermediate frequency and provides a l+r signal; an AM stereo detector which also receives said AM/PM modulated intermediate frequency and provides an l−r signal, said AM stereo detector comprising:

means for receiving and limiting the amplitude of said AM/PM modulated signal to eliminate said amplitude modulation therefrom and provide a signal having PM (phase modulation) only;

a FM quadrature detector for receiving said PM signal, and recovering PM information in the same manner as FM information from said limited PM signal representative of a l−r signal;

means for integrating said PM signal recovered from said limited signal to obtain a true PM signal;

means for sampling said output from said integrator and determining if a 5 Hz signal is present therewith, and providing a control signal indicative of the presence of said 5 Hz signal on a stereo broadcast, wherein said means for sampling comprises a 5 Hz band pass filter, means for squaring the wave shape of said 5 Hz filtered signal, and a missing pulse detector for providing said control signal when said 5 Hz squared signal occurs at a selected rate;

a squelch gate for receiving said l−r signal from said integrator and for receiving said control signal, and for allowing said l−r signal to pass through said squelch gate in response to said control signal indicating a stereo broadcast; and

means for receiving and vectorially combining said l+r signals and said l−r signals to provide a 2l or L signal and a 2r or R signal representative of two channels in a stereo AM broadcast.

4,477,925

CLIPPED SPEECH-LINEAR PREDICTIVE CODING SPEECH PROCESSOR

James M. Avery, Wichita, and Elmer A. Hoyer, Bel Aire, both of Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 11, 1981, Ser. No. 329,776

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—43 **4 Claims**

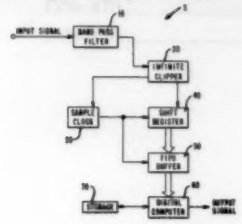
1. An apparatus for matching a presently spoken speech

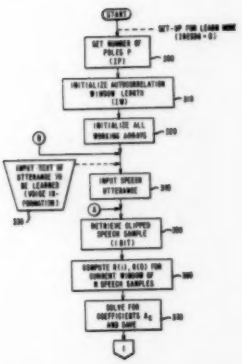
utterance with a corresponding one of a desired plurality of previously spoken speech utterances comprising:

signal quantizing means having an output terminal, and an input terminal for receiving analog input signals representing spoken speech utterances including a desired plurality of previously spoken speech utterances and a presently spoken speech utterance, said signal quantizing means quantizing said analog input signal on its input terminal into a binary value on its output terminal;

sampling means having an output, and an input connected to the output terminal of said signal quantizing means, said sampling means periodically sampling the binary value on the output terminal of said quantizing means and placing on its output, said binary value in a string of binary bits having a predetermined number of bits;

buffer means having an output, and an input connected to the output of said sampling means, said buffering means storing each complete string of binary bits appearing on





the output of said sampling means in a sequential fashion throughout the duration of said analog input signal on the input terminal of said quantizing means such that the number of said strings for a particular one of said spoken speech utterances is dependent upon the duration of said analog input signal;

analyzing means having a storage interconnect, an output, and an input connected to the output of said buffer means, said analyzing means determining autocorrelation functions of each of said strings of binary bits of said spoken speech utterances stored in said buffer means, determining linear predictive coefficients of said autocorrelation functions for each of said spoken speech utterances, and placing said linear predictive coefficients on the output of said analyzing means;

storage means connected to the storage interconnect of said analyzing means, said storage means successively storing said linear predictive coefficients and identifying data for each of said desired plurality of previously spoken speech utterances; and

said analyzing means further including means calculating distance measures between the linear predictive coefficients of said presently spoken speech utterance and the linear predictive coefficients of selected ones of said desired plurality of previously spoken speech utterances stored in said storage means, means finding the minimum values of said distance measures, and means for placing on the output of said analyzing means, the identifying data stored for the previously spoken speech utterance corresponding to said minimum values of said distance measures, thereby matching said presently spoken speech utterance with a corresponding one of said desired plurality of previously spoken speech utterances.

4,477,926

PROCESS FOR INSPECTING AND AUTOMATICALLY SORTING OBJECTS SHOWING PATTERNS WITH CONSTANT DIMENSIONAL TOLERANCES AND APPARATUS FOR CARRYING OUT SAID PROCESS

Claude J. A. Linger, Paris, and Gisele C. Locicero, Evry, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

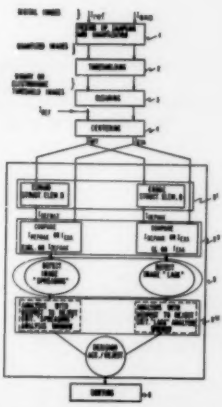
Filed Dec. 14, 1981, Ser. No. 330,411

Claims priority, application European Pat. Off., Dec. 18, 1980, 80430033.3

The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.

Int. Cl.³ G06K 9/36

U.S. Cl. 382—8 **16 Claims**



1. A process fo: inspecting and automatically sorting objects showing patterns provided with constant dimensional tolerances, of the type including the comparison of image I_{ref} of a reference object with image I_{exa} of an object to be inspected, wherein image I_{exa} being able to show geometrical defects with respect to the reference object, said process characterized in that it includes the following steps:

Step 1, processing images I_{ref} and I_{exa} to provide electronic binary images I_{REF} and I_{EXA}, respectively,

Step 2, defining a structuring element B for each image point of the said electronic binary image and adapted to the dimensional tolerances of the said object to be inspected and the construction of the electronic images $I_{REF\,max}$ and $I_{REF\,min}$ which consist in image I_{REF} expanded and eroded respectively by structuring element B,

Step 3, forming the images of the "spreading" or "lack" type defects by respectively carrying out the following logic operations:

$[I_{REF\,max}$ OR $I_{EXA}]$ EXC. OR $I_{REF\,max}$ and

$[I_{REF\,min}$ OR $I_{EXA}]$ EXC. OR I_{EXA} and

Step 4, analyzing the defects with respect to a reject criterion which defines a maximum allowed size for the defects.

DESIGN PATENTS

GRANTED OCT. 16, 1984

ERRATA

For CLASS	See PATENT NO.
D06–470	275,969
D06–470	275,970

DESIGNS

OCTOBER 16, 1984

275,904
BRASSIERE
Jeanne M. Martini, Brooklyn, N.Y., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed Jun. 7, 1982, Ser. No. 385,775
Term of patent 14 years
U.S. Cl. D2—24

275,905
BRASSIERE
Jack Locascio, Bayonne, N.J., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed Jun. 7, 1982, Ser. No. 385,842
Term of patent 14 years
U.S. Cl. D2—24

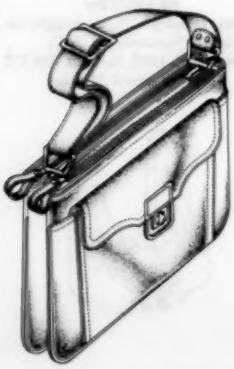
275,906
BRASSIERE
Flavia Di Tullio, New York, N.Y., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed Jun. 7, 1982, Ser. No. 385,843
Term of patent 14 years
U.S. Cl. D2—24

275,907
BRASSIERE
Jack Locascio, Bayonne, N.J., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed Jun. 7, 1982, Ser. No. 385,845
Term of patent 14 years
U.S. Cl. D2—24

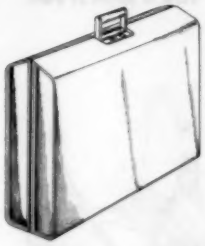
275,908
BRASSIERE
Jeanne M. Martini, Brooklyn, N.Y., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed Jun. 7, 1982, Ser. No. 385,777
Term of patent 14 years
U.S. Cl. D2—24

275,909
COMBINED TOTEBAG AND BACK REST
Kathleen Y. Spiegelman, 3627 Serra Rd., Malibu, Calif. 90265
Filed Feb. 8, 1982, Ser. No. 347,019
Term of patent 14 years
U.S. Cl. D3—43

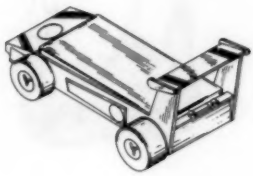
275,910
PURSE
Otto K. Schimmel, Scottsdale, Ariz., assignor to AMBA Marketing Systems, Inc., Phoenix, Ariz.
Filed Apr. 5, 1982, Ser. No. 365,492
Term of patent 14 years
U.S. Cl. D3—48



275,911
LUGGAGE CASE
Makio Hasuike, Milan, Italy, assignor to Poltrona Frau S.p.A., Tolentino, Italy
Filed Jan. 11, 1982, Ser. No. 338,495
Term of patent 14 years
U.S. Cl. D3—76

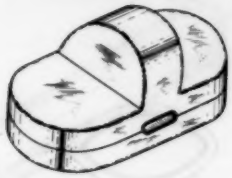


275,912
CHILD'S BED
Lawrence P. Hydrusko, 1635 Manitoba Dr., and Henry Harvey, 1133 Bennington Dr., both of Sunnyvale, Calif. 94087
Filed Jan. 18, 1982, Ser. No. 339,989
Term of patent 14 years
U.S. Cl. D6—388



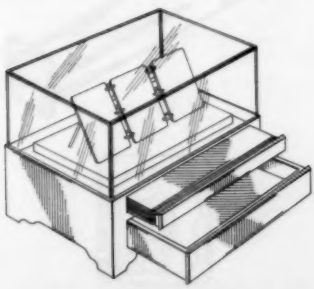
275,913
ARTIST'S EASEL BENCH
Ardythe M. Mulligan, Box 98, Winesburg, Ohio 44690
Filed Jul. 19, 1982, Ser. No. 399,360
Term of patent 14 years
U.S. Cl. D6—301

275,914
SEAT MODULE
Robert P. Gersin, 11 E. 22nd St., New York, N.Y. 10010
Filed Mar. 4, 1982, Ser. No. 354,732
Term of patent 14 years
U.S. Cl. D6—357

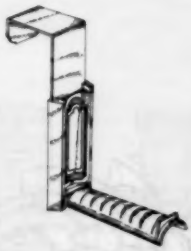


275,915
WALL MOUNTED RECORD RACK
Christer O. Gärdsby, Ulricedalsgarden, S-21228 Malmö , Sweden
Filed Jun. 20, 1980, Ser. No. 161,640
Claims priority, application Sweden, Dec. 21, 1979, 79-2800
Term of patent 14 years
U.S. Cl. D6—569

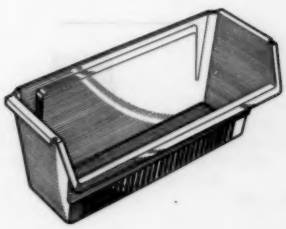
275,916
MEMORIAL CONTAINER
Jene A. Brandel, 4898 Lazy H La., Christmas, Fla. 32709
Filed Aug. 3, 1981, Ser. No. 289,284
Term of patent 14 years
U.S. Cl. D6—436



275,917
GARMENT HANGER SUPPORT
Ruediger Einhorn, Katonah, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Feb. 4, 1982, Ser. No. 345,762
Term of patent 14 years
U.S. Cl. D6—567



275,918
BIN FOR STORAGE RACK
William D. Taylor, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Feb. 25, 1982, Ser. No. 352,241
Term of patent 14 years
U.S. Cl. D6—510



275,919
SETTEE FRAME OR THE LIKE
Keith D. Crabtree, Van Buren, Ark., assignor to Fort Smith Chair Company, Fort Smith, Ark.
Filed Aug. 28, 1980, Ser. No. 182,420
Term of patent 14 years
U.S. Cl. D6—370

275,920
DISPLAY RACK MODULE

Wolf-Dietrich Hannecke, Rischenau Weg 6, 3410 Northeim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 38,723, May 14, 1979, Pat. No. Des. 266,210. This application Feb. 1, 1982, Ser. No. 344,784
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1979, MR 47
Term of patent 14 years
U.S. Cl. D6—510

275,921
DRAWER DIVIDER

William W. Ward, Clayton, N.C., assignor to Southern Case, Inc., Raleigh, N.C.

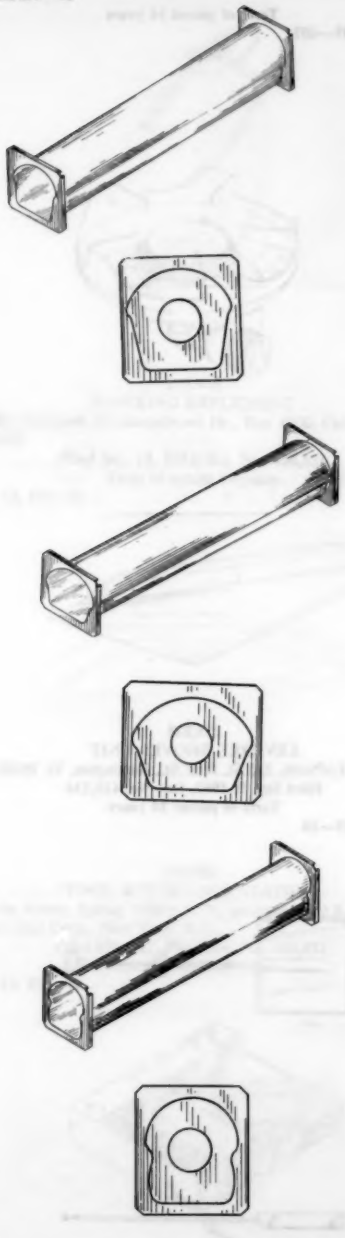
Filed Jul. 22, 1982, Ser. No. 400,851
Term of patent 14 years
U.S. Cl. D6—510

275,922
BOWL

Ronald D. Weil, University City, Mo., assignor to Swiss American Importing Co., St. Louis, Mo.

Filed Jun. 7, 1982, Ser. No. 386,028
Term of patent 14 years
U.S. Cl. D7—1

275,923
MEAT MOLD OR SIMILAR ARTICLE
Stephen H. Wimmer, West Point, Nebr., assignor to Wimmer's Meat Products, Inc., West Point, Nebr.
Filed May 19, 1982, Ser. No. 379,763
Term of patent 14 years
U.S. Cl. D7—43



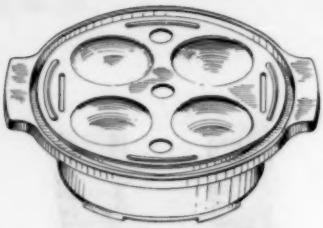
275,924
BEVERAGE DISPENSER
Herschel E. Andrews, Jr., 6325 Sauterne Dr., Jacksonville, Fla. 32210
Filed Jun. 7, 1982, Ser. No. 385,453
Term of patent 14 years
U.S. Cl. D7—301

275,925

MICROWAVE EGG COOKER BASE

Robert F. Bowen, Burlington, and Wayne I. Pollack, Arlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 7, 1982, Ser. No. 386,149
Term of patent 14 years
U.S. Cl. D7—357

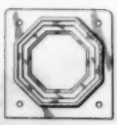


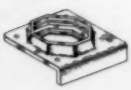
275,926

COMBINED HOLDER AND OPENER FOR AN EXPRESSO COFFEEMAKER OR THE LIKE

Oscar M. Corona, 5667 NW. 195th Ter., Miami, Fla. 33055

Filed May 10, 1982, Ser. No. 376,427
Term of patent 14 years
U.S. Cl. D7—399



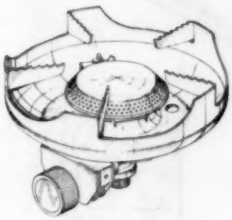


275,927

COMBINED BURNER UNIT AND VESSEL SUPPORT

Ming K. Chan, 1st Floor, 58 Hung To Rd., Kwun Tong, Kowloon, Hong Kong

Filed Oct. 16, 1981, Ser. No. 311,960
Claims priority, application United Kingdom, Jul. 7, 1981, 1 001 332
Term of patent 14 years
U.S. Cl. D7—407

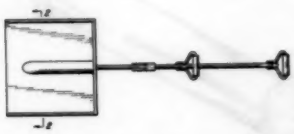


275,928

LEVERED SHOVEL UNIT

Daniel R. LoPresti, 233 St. Paul St., Burlington, Vt. 05401

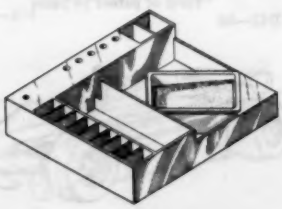
Filed Sep. 9, 1982, Ser. No. 416,114
Term of patent 14 years
U.S. Cl. D8—10



275,929
BURNING OBJECT HANDLING DEVICE
Emile J. Atkinson, P.O. Box 705, Loyalton, Calif. 96118
Filed Jan. 4, 1982, Ser. No. 336,720
Term of patent 14 years
U.S. Cl. D8—14

275,930
PAINTING IMPLEMENT
Phillip Sheppard, 93 Sandalwood Dr., Box 1100, Cotuit, Mass. 02635
Filed Sep. 28, 1982, Ser. No. 426,125
Term of patent 14 years
U.S. Cl. D8—16

275,931
TOOL AND SOLDER STATION
Marvin Kober, Spring Valley, N.Y., assignor to O.K. Machine and Tool Corp., New York, N.Y.
Filed Mar. 17, 1982, Ser. No. 358,892
Term of patent 14 years
U.S. Cl. D8—71



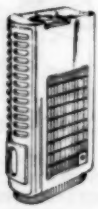
275,932
SCREW DRIVER HANDLE
Hans Himbert, Bromma, and Bengt Palmgren, Saltsjöbaden, Sweden, assignors to AB Bahco Verktyg, Enkoping, Sweden
Filed Mar. 5, 1982, Ser. No. 355,091
Claims priority, application Sweden, Oct. 19, 1981, 81-2358; Oct. 19, 1981, 81-2359
Term of patent 14 years
U.S. Cl. D8—83

275,933
CONTAINER MODULE
Alan C. Topor, and Nora I. Topor, both of 3838 Mainsail, Westlake Village, Calif. 91361
Filed Jun. 28, 1982, Ser. No. 393,027
Term of patent 14 years
U.S. Cl. D9—300

275,934
BOTTLE
Dale R. Wassergord, Kansas City, Mo.; Dale E. Fahnstrom, and Archie G. Drummond, Jr., both of Chicago, Ill., assignors to Realex Corporation, Kansas City, Mo.
Filed Jun. 17, 1982, Ser. No. 389,160
Term of patent 14 years
U.S. Cl. D9—376

275,935
CHILD-SAFE ACTUATOR FOR PRESSURIZED CONTAINER
Robert E. Corba, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Division of Ser. No. 23,876, Mar. 26, 1979, , which is a continuation-in-part of Ser. No. 786,750, Apr. 11, 1977,. This application Jun. 10, 1982, Ser. No. 387,066
Term of patent 14 years
U.S. Cl. D9—448

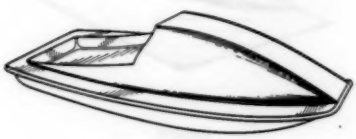
275,936
PORTABLE SMOKE DETECTOR
William F. Coyer, 47 Yorktown Rd., East Brunswick, N.J. 08816
Filed Jun. 17, 1981, Ser. No. 274,510
Term of patent 14 years
U.S. Cl. D10—106



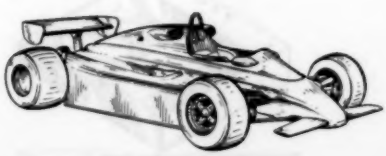
275,937
SCORING MACHINE FOR PLAYING THE CARD GAME OF GIN
Marvin Lederman, 5071 South Syracuse, Denver, Colo. 80237
Filed Sep. 8, 1981, Ser. No. 300,063
Term of patent 14 years
U.S. Cl. D10—46.1

275,938
TROPHY HAVING A VERTICAL TIME DISPLAY
Iroy N. Sonier, R.R.-1, Box 453, Cocagne NB, Canada E0A 1KO
Filed Sep. 23, 1983, Ser. No. 535,061
Term of patent 14 years
U.S. Cl. D11—131

275,939
SLED
Sven O. Wilje, Sagvägen 1, 791 51 Falun, Sweden
Filed Oct. 28, 1981, Ser. No. 315,707
Term of patent 14 years
U.S. Cl. D12—11



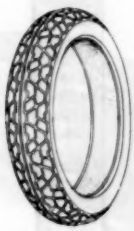
275,940
MODEL RACING CAR
Martin B. Ogilvie, Wymondham, England, assignor to Team Lotus International Limited, Norfolk, England
Filed Aug. 17, 1982, Ser. No. 408,935
Claims priority, application United Kingdom, Feb. 17, 1982, 1,005,168
Term of patent 14 years
U.S. Cl. D12—88



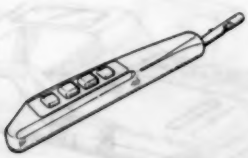
275,941
VEHICLE TIRE
Hideaki Nishio, Saitama; Hiroshi Kojima, Tokyo, and Makoto Yamauchi, Saitama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Apr. 26, 1982, Ser. No. 372,263
Claims priority, application Japan, Oct. 27, 1981, 56-47507
Term of patent 14 years
U.S. Cl. D12—147

FIG. 1

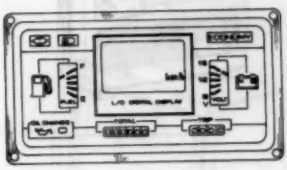
275,942
TIRE FOR A VEHICLE WHEEL
Hisashi Shirasboji, Kobe, Japan, assignor to Dunlop Limited, London, England
Filed Jul. 9, 1982, Ser. No. 398,120
Claims priority, application Japan, Jan. 13, 1982, 57-1015
Term of patent 14 years
U.S. Cl. D12—147



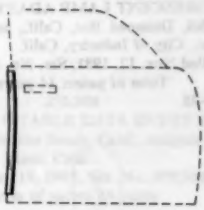
275,943
AUTOMOBILE TURN SIGNAL LEVER WITH SPEED CONTROL BUTTONS
Holt Hickman; Neal G. Shields, and Mark L. Shaw, all of Fort Worth, Tex., assignors to Specific Cruise Systems, Inc., Forth Worth, Tex.
Filed Apr. 5, 1982, Ser. No. 365,868
Term of patent 14 years
U.S. Cl. D12—174

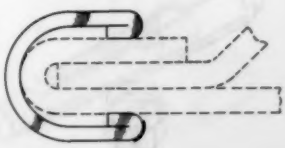


275,944
INSTRUMENT PANEL FOR A MOTORCYCLE
Mamoru Ito, Shiki, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 23, 1982, Ser. No. 410,827
Claims priority, application Japan, Feb. 22, 1982, 57-7264
Term of patent 14 years
U.S. Cl. D12—192



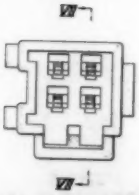
275,945
DOOR EDGE GUARD
Robert Adell, Novi, Mich., assignor to U.S. Product Development Company, Sunnyvale, Tex.
Filed Nov. 10, 1980, Ser. No. 205,419
Term of patent 14 years
U.S. Cl. D12—190





275,946
ELECTRIC GENERATOR
Kenji Ekuan, Tokyo, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Jul. 23, 1982, Ser. No. 401,360
Claims priority, application Japan, Jan. 27, 1982, 57-3271
Term of patent 14 years
U.S. Cl. D13—1

275,947
CONNECTOR HOUSING
Yasuharu Morisi, Suzuka; Yoshio Ito, Yokkaichi, and Atsushi Sakatani, Matsusaka, all of Japan, assignors to Tokai Electric Wire Co., Ltd., Yokkaichi, Japan
Filed Feb. 25, 1982, Ser. No. 352,458
Claims priority, application Japan, Aug. 31, 1981, 56-38420
Term of patent 14 years
U.S. Cl. D13—24

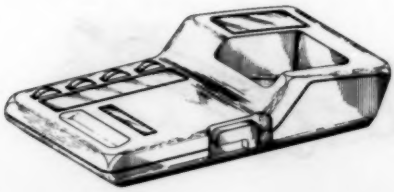


275,948
FLUORESCENT LAMP ADAPTOR BASE
Usman U. Vakil, Diamond Bar, Calif., assignor to Lights of America, Inc., City of Industry, Calif.
Filed Nov. 17, 1981, Ser. No. 322,264
Term of patent 14 years
U.S. Cl. D13—25

275,949
FLUORESCENT LAMP ADAPTER WITH INTEGRAL DIFFUSER STUD
Usman U. Vakil, Diamond Bar, Calif., assignor to Lights of America, Inc., City of Industry, Calif.
Filed Dec. 14, 1981, Ser. No. 330,557
Term of patent 14 years
U.S. Cl. D13—25

275,950
TELEPHONE
Eric J. Marshall, 5 Carlton Gardens, London SW1, England
Filed Dec. 4, 1981, Ser. No. 327,563
Claims priority, application United Kingdom, Jun. 4, 1981, 1000804
Term of patent 14 years
U.S. Cl. D14—53

275,951
TELEPHONE CRADLE OR SIMILAR ARTICLE
Terrance N. Taylor, Cary, Ill., assignor to Motorola Inc., Schaumburg, Ill.
Filed Apr. 19, 1982, Ser. No. 369,453
Term of patent 14 years
U.S. Cl. D14—60



275,952

TELEVISION RECEIVER CABINET

Melvin H. Boldt, deceased, late of Glenview, Ill.; by Melvin W. Boldt, executor, Palatine, Ill.; David P. Chuboff, North Barrington, Ill., and Wayne J. Franek, Palatine, Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 1, 1982, Ser. No. 353,277

Term of patent 14 years

U.S. Cl. D14—82

275,953

TELEVISION RECEIVER CABINET

Melvin H. Boldt, deceased, late of Glenview, Ill.; by Melvin W. Boldt, executor, Palatine, Ill.; David P. Chuboff, N. Barrington, Ill.; Arnold Goldman, Clarendon Hills, Ill., and Wayne J. Franek, Palatine, Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 1, 1982, Ser. No. 353,303

Term of patent 14 years

U.S. Cl. D14—82

275,954

VOICE AND DATA TELEPHONE SET

J. Scott Gibson, Ottawa, Canada, assignor to Mitel Corporation, Kanata, Canada

Filed Mar. 9, 1982, Ser. No. 356,608

Claims priority, application Canada, Sep. 11, 1981, 11-09-81-2

Term of patent 14 years

U.S. Cl. D14—101

275,955

DATA TRANSMISSION TERMINAL

Michel Moraine, Boersch, France, assignor to La Telephonie Industrielle et Commerciale Telic Alcatel, Strasbourg, France

Filed Mar. 8, 1982, Ser. No. 355,389

Claims priority, application France, Oct. 22, 1981, 81 3637

Term of patent 14 years

U.S. Cl. D14—106

275,956

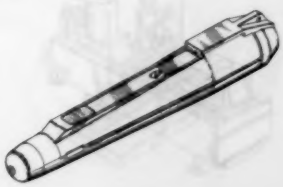
HOUSING FOR PORTABLE DATA ENTRY TERMINAL

David W. Culp, Huntington Beach, Calif., assignor to MSI Data Corporation, Costa Mesa, Calif.

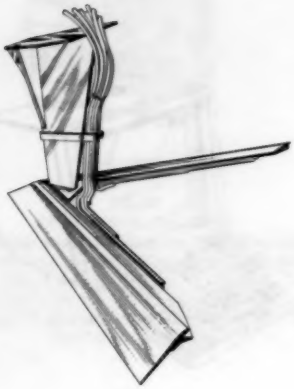
Filed May 19, 1982, Ser. No. 379,930

Term of patent 14 years

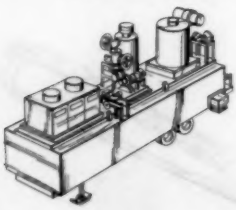
U.S. Cl. D14—114



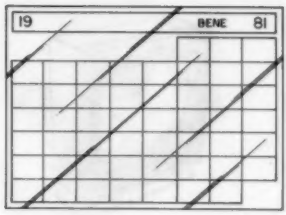
275,957
COMBINATION V-BLADE PLOW AND FERTILIZER SPREADER
Richard L. Sterrett, P.O. Box 339, Quinter, Kans. 67752
Filed May 27, 1982, Ser. No. 382,770
Term of patent 14 years
U.S. Cl. D15—11



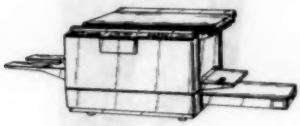
275,958
PORTABLE ICE PLANT
Daniel E. Burns, Camarillo, Calif., assignor to Demco Inc., Oxnard, Calif.
Filed Jul. 26, 1982, Ser. No. 402,047
Term of patent 14 years
U.S. Cl. D15—80



275,959
MICROFICHE
Hubert F. Gevers, 38 Lange Lozanastraat, Antwerpen, Belgium
Filed Apr. 6, 1982, Ser. No. 365,902
Claims priority, application Belgium, Oct. 7, 1981, 2591.01-06
Term of patent 14 years
U.S. Cl. D16—26



275,960
ELECTRONIC COPYING MACHINE
Yohzoh Matsuzaka, Yokohama, and Shigeki Yasutani, Kashiwa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Apr. 30, 1982, Ser. No. 373,622
Term of patent 14 years
U.S. Cl. D16—31



275,961
PAIR OF SUNGLASSES
Aaron M. Markovitz, Rochester, and Robert H. Ramp, Pittsford, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.
Division of Ser. No. 346,967, Feb. 8, 1982, Pat. No. 273,794. This application Mar. 5, 1984, Ser. No. 586,385
Term of patent 14 years
U.S. Cl. D16—112

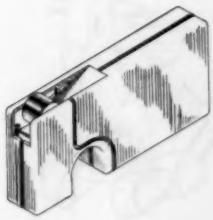
275,962
GUITAR
Charles D. Harlen, 2006 Wooddale Dr., Huntsville, Ala. 35801
Filed Jun. 1, 1982, Ser. No. 383,737
Term of patent 14 years
U.S. Cl. D17—18

275,963
HEADSTOCK FOR GUITAR
Daniel J. Smith, Fullerton, Calif., assignor to CBS Inc., New York, N.Y.
Filed Jun. 4, 1982, Ser. No. 385,324
Term of patent 14 years
U.S. Cl. D17—20

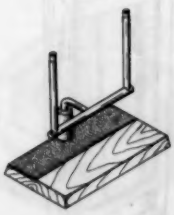
275,964
ELECTRONIC CALCULATOR
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Turin, Italy
Filed Aug. 23, 1982, Ser. No. 410,600
Claims priority, application Italy, Feb. 25, 1982, 52964/82[U]
Term of patent 14 years
U.S. Cl. D18—8

275,965
CARTRIDGE FOR A NON-IMPACT PRINTER
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Turin, Italy
Filed Feb. 8, 1982, Ser. No. 346,757
Term of patent 14 years
U.S. Cl. D18—22

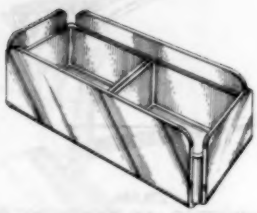
275,966
TAPE LAMINATING AND DISPENSING DEVICE
William R. Worrell, Hopkins, Minn., assignor to Kroy Inc., St. Paul, Minn.
Filed Mar. 29, 1982, Ser. No. 363,014
Term of patent 14 years
U.S. Cl. D19—69



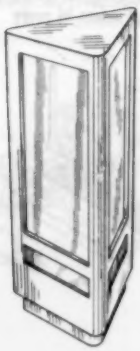
275,967
PEN AND PENCIL DESK SET
George G. Morano, Jr., 4110 Sharonknoll Ct., Cincinnati, Ohio 45241
Filed Mar. 18, 1982, Ser. No. 359,287
Term of patent 14 years
U.S. Cl. D19—75



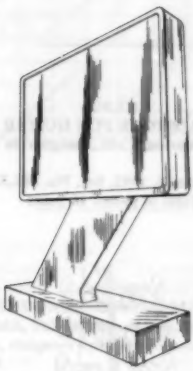
275,968
DESK TRAY
David Battle, Yellow Springs, Ohio, assignor to Visual Information Institute, Inc., Xenia, Ohio
Filed May 3, 1982, Ser. No. 374,091
Term of patent 14 years
U.S. Cl. D19—75



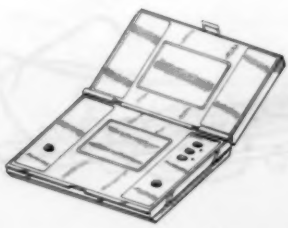
275,969
ILLUMINABLE DISPLAY CASE
James B. Bowers, Tulsa, Okla., assignor to H and H Promotions, Inc., Tulsa, Okla.
Filed Dec. 31, 1981, Ser. No. 336,079
Term of patent 14 years
U.S. Cl. D6—470



275,970
ILLUMINABLE DISPLAY CASE
James B. Bowers, Tulsa, Okla., assignor to H and H Promotions, Inc., Tulsa, Okla.
Filed Dec. 31, 1981, Ser. No. 336,078
Term of patent 14 years
U.S. Cl. D6—470



275,971
HAND-HELD TYPE ELECTRONIC GAME HOUSING
Gunpei Yokoi, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan
Filed Jul. 1, 1982, Ser. No. 394,299
Claims priority, application Japan, Apr. 2, 1982, 57-14250
Term of patent 14 years
U.S. Cl. D21—13



275,972
COMBINED MIRROR AND RANDOM SELECTOR FOR A NUMBER GAME
Marie T. Bahier, 221 W. 82nd St., New York, N.Y. 10024
Filed Apr. 21, 1982, Ser. No. 370,579
Term of patent 14 years
U.S. Cl. D21—37

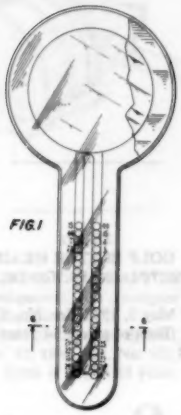
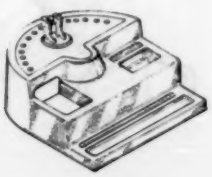
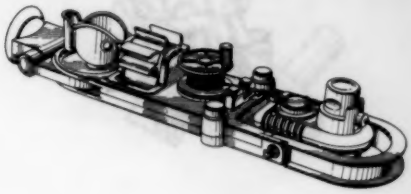


FIG. 1

275,973
COMBINED HOLDER FOR DRAWING TOY AND DOLL STAND
Joseph A. Marino, P.O. Box 306, S. Ryland Rd., Whitehouse, N.J. 08888
Filed Nov. 13, 1981, Ser. No. 321,250
Term of patent 14 years
U.S. Cl. D21—59



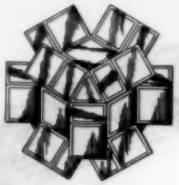
275,974
BATH TOY
Marc Rivollet, Oyonnax, France, assignor to Etablissements Fernand Berchet, Oyonnax, France
Filed Mar. 26, 1982, Ser. No. 362,123
Claims priority, application France, Sep. 29, 1981, 81 3315
Term of patent 14 years
U.S. Cl. D21—59



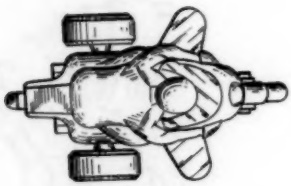
275,975
ROCKING TOY
David J. Ciganko, Buffalo, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 27, 1983, Ser. No. 461,641
Term of patent 14 years
U.S. Cl. D21—66

275,976
AERIAL TOY
Teresa E. Williams, 39 Flamingo Rd., Rockport, Tex. 78382
Filed Jul. 12, 1982, Ser. No. 396,918
Term of patent 14 years
U.S. Cl. D21—86

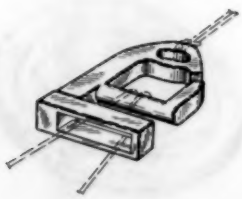
275,977
CUBE PUZZLE
Bruce T. Boone, 4402 Simpson Ct., Kennesaw, Ga. 30144
Filed Nov. 5, 1982, Ser. No. 439,391
Term of patent 14 years
U.S. Cl. D21—107



275,978
COMBINED TOY MOTORCYCLE AND RIDER
Melvin Kennedy, New York, N.Y.; Dietmar Nagel, Chester, N.J., and Avi Arad, Westport, Conn., assignors to Darda Inc., East Brunswick, N.J.
Filed Sep. 7, 1982, Ser. No. 415,259
Term of patent 14 years
U.S. Cl. D21—134

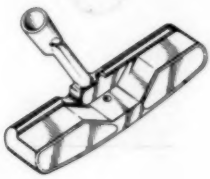


275,979
EXERCISE DEVICE
Clement G. Eischen, Sr., 601 NE. 167th Pl., Portland, Oreg. 97230
Filed Jul. 1, 1982, Ser. No. 394,421
Term of patent 14 years
U.S. Cl. D21—191



275,980
AUTOMATIC TEE-UP APPARATUS
Toshihiko Oze, 13-4 Negishi 2-chome, Taitoh-ku, Tokyo, Japan
Filed Jul. 11, 1979, Ser. No. 56,714
Term of patent 14 years
U.S. Cl. D21—208

275,981
GOLF PUTTER HEAD
Clovis R. Duclos, 6327 Marina Pacifica Dr., Long Beach, Calif. 90803
Filed May 3, 1982, Ser. No. 374,288
Term of patent 14 years
U.S. Cl. D21—219



275,982
PUSHER DEVICE FOR BOWLING BALL
Antoon Heijligers, 4442 New York Ave., La Crescenta, Calif. 91214
Filed Jun. 28, 1982, Ser. No. 392,628
Term of patent 14 years
U.S. Cl. D21—233

275,983

FISHING REEL

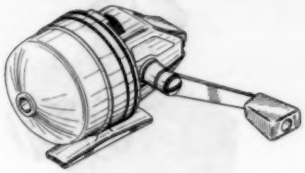
Masakazu Sakamoto, and Takeshi Shohoji, both of Funabashi, Japan, assignors to Ryobi Limited, Fuchu, Japan

Division of Ser. No. 340,055, Jan. 18, 1982,. This application Jan. 18, 1984, Ser. No. 571,705

Claims priority, application Japan, Jul. 31, 1981, 56-34181; Jul. 31, 1981, 56-34182; Sep. 1, 1981, 56-38807

Term of patent 14 years

U.S. Cl. D22—25



275,984

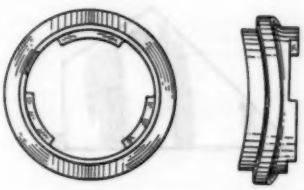
FUEL TANK CAP ADAPTOR RING

James R. Shaw, Amagansett, N.Y., assignor to Shaw Aero Devices, Inc., East Hampton, N.Y.

Division of Ser. No. 318,426, Nov. 5, 1981,. This application Dec. 15, 1983, Ser. No. 561,932

Term of patent 14 years

U.S. Cl. D23—1



275,985

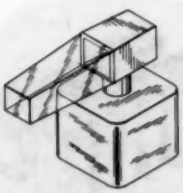
HANDLE SET FOR A SANITARY FITTING OR SIMILAR ARTICLE

Henry M. Stairs, Jr., Neshanic, N.J., and James E. Neimann, Louisville, Ky., assignors to American Standard Inc., New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,914

Term of patent 14 years

U.S. Cl. D23—29



275,986

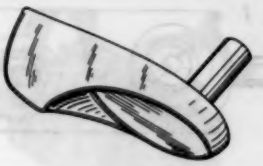
TRIP LEVER FOR A WATER CLOSET

Henry M. Stairs, Jr., Neshanic, N.J., assignor to American Standard Inc., New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,915

Term of patent 14 years

U.S. Cl. D23—29



275,987

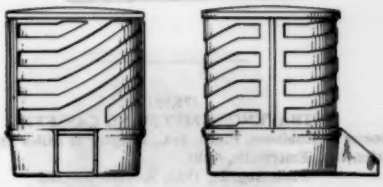
COAL CONTAINER

William B. Schlegel, R.D. #2, Box #96, Cranbury, N.J. 08512

Filed Jun. 22, 1981, Ser. No. 276,411

Term of patent 14 years

U.S. Cl. D23—138 S



275,988

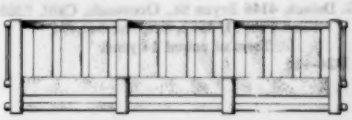
CEILING AIR DIFFUSER OR THE LIKE

Robert W. Walker, Loveland, Colo., assignor to Walker Manufacturing Company, Fort Collins, Colo.

Filed Feb. 22, 1982, Ser. No. 350,880

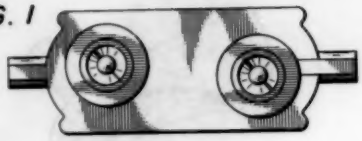
Term of patent 14 years

U.S. Cl. D23—115

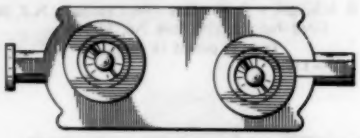


275,989
INTRAVENOUS METERING CASSETTE
Thomas P. Robinson, Plano, Tex., assignor to Quest Medical, Inc., Carrollton, Tex.
Filed Aug. 22, 1983, Ser. No. 524,974
Term of patent 14 years
U.S. Cl. D24—8

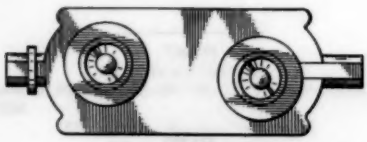
FIG. 1



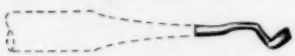
275,990
INTRAVENOUS METERING CASSETTE
Thomas P. Robinson, Plano, Tex., assignor to Quest Medical, Inc., Carrollton, Tex.
Filed Aug. 22, 1983, Ser. No. 525,287
Term of patent 14 years
U.S. Cl. D24—8



275,991
INTRAVENOUS METERING CASSETTE
Thomas P. Robinson, Plano, Tex., assignor to Miles Laboratories, Inc., Emeryville, Calif.
Filed Aug. 22, 1983, Ser. No. 525,288
Term of patent 14 years
U.S. Cl. D24—8



275,992
DENTAL AMALGAM CONDENSOR TIP OR THE LIKE
Steven G. Detsch, 4146 Bryan St., Oceanside, Calif. 92054
Filed Feb. 11, 1982, Ser. No. 347,774
Term of patent 14 years
U.S. Cl. D24—10

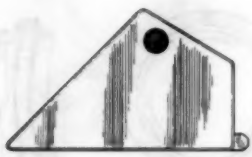


275,993
UNIVERSAL PACIFIER CASE
Kathryn A. Ryan, and Gregory F. Ryan, both of 77 Erie St., Dumont, N.J. 07628
Filed Mar. 29, 1982, Ser. No. 363,309
Term of patent 14 years
U.S. Cl. D24—47

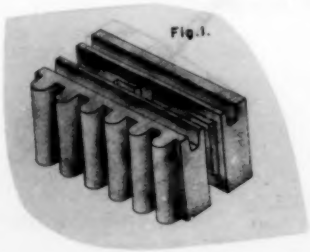
FIG. 2

FIG. 5

275,994
ICE FISHING SHELTER
Gary L. Harrington, Inver Grove Heights, Minn., assignor to G & H Sports Enterprises, St. Louis Park, Minn.
Filed Sep. 27, 1982, Ser. No. 423,550
Term of patent 14 years
U.S. Cl. D25—16

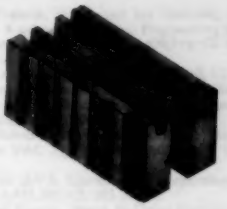


275,995
BUILDING BLOCK
John N. Rassias, 33 SE. Fourth St., Boca Raton, Fla. 33432, and Cecily M. Clark, 565 Park Ave., New York, N.Y. 10021
Filed Sep. 29, 1982, Ser. No. 428,065
Term of patent 14 years
U.S. Cl. D25—89



275,996
BUILDING BLOCK
John N. Rassias, 33 SE. Fourth St., Boca Raton, Fla. 33432, and Cecily M. Clark, 565 Park Ave., New York, N.Y. 10021
Filed Sep. 29, 1982, Ser. No. 428,066
Term of patent 14 years
U.S. Cl. D25—89

275,997
BUILDING BLOCK
John N. Rassias, 33 SE. Fourth St., Boca Raton, Fla. 33432, and Cecily M. Clark, 565 Park Ave., New York, N.Y. 10021
Filed Sep. 29, 1982, Ser. No. 428,067
Term of patent 14 years
U.S. Cl. D25—91



275,998
BUILDING BLOCK
John N. Rassias, 33 SE. Fourth St., Boca Raton, Fla. 33432, and Cecily M. Clark, 565 Park Ave., New York, N.Y. 10021
Filed Sep. 29, 1982, Ser. No. 428,068
Term of patent 14 years
U.S. Cl. D25—89

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF OCTOBER, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aaronson, Barry L.: *See*—
Giem, David A.; Aaronson, Barry L.; and Jones, Charles K., 4,476,880, Cl. 128-778.000.

AB Tesi: *See*—
Silander, Torsten G., 4,477,574, Cl. 436-70.000.

Abe, Masanori; and Tamaura, Yutaka, to Denki Kagaku Kogyo Kabushiki Kaisha; and Mitsubishi Chemical Industries Ltd. Process for forming a ferrite film. 4,477,319, Cl. 204-56.00R.

Abe, Michiharu: *See*—
Oba, Hideaki; Kunikane, Makoto; Umehara, Masaakira; Tanikawa, Kiyoshi; and Abe, Michiharu, 4,477,555, Cl. 430-273.000.

Aboujaoude, Khalil F.: *See*—
Byrd, Thomas M., Jr.; and Aboujaoude, Khalil F., 4,477,861, Cl. 361-371.000.

ACF Industries, Incorporated: *See*—
Partridge, Charles C., 4,477,055, Cl. 251-174.000.

Adachi, Keiichi: *See*—
Ichijima, Seiji; Sakanoue, Kei; Kobayashi, Hidetoshi; and Adachi, Keiichi, 4,477,563, Cl. 430-544.000.

Adamek, Frank C., to Gray Tool Company. Fire resistant connections and U-like sealing means therefor. 4,477,091, Cl. 277-211.000.

Adamek, Frank C., to Gray Tool Company. Fire resistant connections and T-like sealing means therefor. 4,477,093, Cl. 277-211.000.

Adams, Don L.: *See*—
Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., 4,477,876, Cl. 364-434.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Shibata, Toshihiro, 4,477,616, Cl. 524-102.000.

Aderneck, Stephen E. Portable chainsaw milling guide attachment. 4,476,759, Cl. 83-574.000.

Adkins, Claude G.: *See*—
Shaver, John D.; Adkins, Claude G.; and Spengler, Walter, 4,477,263, Cl. 55-6.000.

Adkins, David E.: *See*—
Wittman, Robert H.; Adkins, David E.; and Chin, Arthur H. T., 4,477,105, Cl. 285-18.000.

Advani, Hira; Cason, William C.; and Hayes, Gerald E., to International Business Machines Corporation. Method for combining program diskettes in an interactive text processing system. 4,477,880, Cl. 364-900.000.

Agfa-Gevaert AG: *See*—
Kohler, Robert; Nippe, Burkhard; Kober, Heinrich; Schilffarth, Karlchristian; Meckel, Walter; and Quiring, Bernd, 4,477,531, Cl. 428-425.900.

Agfa-Gevaert, N.V.: *See*—
Van de Sande, Christian C.; and Verhecken, Andre, 4,477,554, Cl. 430-223.000.

Agrawal, Balkishan, to Union Carbide Corporation. Steelmaking process using calcium carbide as fuel. 4,477,278, Cl. 75-51.000.

Agut, S.A.: *See*—
Reguant Soler, Jaime, 4,477,703, Cl. 200-76.000.

AHI Operations Limited: *See*—
Millar, Thomas D.; and Phillips, Dougald S. M., 4,476,719, Cl. 73-200.000.

Aiba, Takeshi: *See*—
Matsuura, Tamiaki; Aiba, Takeshi; Fukushima, Takashi; Nishimura, Masanori; Ohtsuki, Hiroshi; Yabuki, Fujio; and Kusakabe, Tomio, 4,476,627, Cl. 29-791.000.

Aid, James D., to Extracorporeal Medical Specialties, Inc. Apparatus for heating or cooling fluids. 4,476,685, Cl. 62-3.000.

Air Products and Chemicals, Inc.: *See*—
Kratz, Wilbur C.; and Sircar, Shivaji, 4,477,264, Cl. 55-25.000.
Kumar, Ravi; Sircar, Shivaji; White, Thomas R.; and Greskovich, Eugene J., 4,477,265, Cl. 55-26.000.

Air Structures International Inc.: *See*—
Fraioli, Donato M., 4,477,503, Cl. 428-102.000.

Aire-Wrap, Inc.: *See*—
Stubbolo, Louis, 4,476,921, Cl. 165-48.00R.

Aisan Industry Co., Ltd.: *See*—
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,477,392, Cl. 261-39.00A.

Aisin Seiki Kabushiki Kaisha: *See*—
Ida, Shuichiro; Ooshima, Shoichi; Horiuchi, Ichiro; and Nishu, Mitsufumi, 4,476,740, Cl. 74-476.000.

Aisin Warner Kabushiki Kaisha: *See*—
Kawamoto, Mutsumi, 4,476,747, Cl. 74-869.000.
Miki, Nobuaki; and Yokoyama, Shoji, 4,476,746, Cl. 74-867.000.
Sumiya, Koji, 4,476,887, Cl. 137-56.000.

Akasaki, Isamu: *See*—
Ohki, Yoshimasa; Toyoda, Yukio; Kobayashi, Hiroyuki; and Akasaki, Isamu, 4,476,620, Cl. 29-569.00L.

Aker, Eric M. Single-wire data transmission system having bidirectional data synchronization, and D.C. power for remote units. 4,477,896, Cl. 370-24.000.

Akimoto, Ryosaku; Yoshida, Yukio; and Ito, Nobuaki, to Mitsubishi Jukogyo Kabushiki Kaisha; and Churyo Engineering Co., Ltd. Air conditioning apparatus for automobiles. 4,476,919, Cl. 165-28.000.

Akita, Shigeyuki: *See*—
Tanaka, Hiroaki; and Akita, Shigeyuki, 4,477,810, Cl. 340-870.370.

Akita, Yoshio; Teshima, Takanori; Torii, Koshi; and Maruyama, Toshinori, to Nippondenso Co., Ltd. Apparatus for controlling electric generation for vehicles. 4,477,766, Cl. 322-28.000.

Akiyama, Toru, to Universal Pioneer Corporation. Tangential error signal generator in PAL type video disc player. 4,477,838, Cl. 358-322.000.

Akkerman, Neil H., to AVA International Corporation. Releasable latching apparatus. 4,477,104, Cl. 285-18.000.

Akridge, James R.; and Vourlis, Harry, to Union Carbide Corporation. Isostatic compression method for producing solid state electrochemical cells. 4,477,545, Cl. 429-191.000.

Aktiebolaget Karlstads Mekaniska Werkstad: *See*—
Andersson, Anders I., 4,477,313, Cl. 162-123.000.

Alago, James L.: *See*—
Lieb, Nathaniel H.; Alderman, Albert D., Jr.; and Alago, James L., 4,477,252, Cl. 433-29.000.

Albarda, Scato, to Dragerwerk Aktiengesellschaft. Apparatus for admixing liquid anesthetics and respiratory gas. 4,477,395, Cl. 261-131.000.

Albers, Teo, Sr. Cattle stanchion apparatus. 4,476,815, Cl. 119-147.00R.

Albert-Frankenthal AG: *See*—
Fischer, Rudolf; and Puschnerat, Helmut, 4,477,066, Cl. 270-52.000.

Albertson, Clarence E.: *See*—
Okubo, Howard S.; Albertson, Clarence E.; and Nibert, Roger K., 4,477,605, Cl. 523-155.000.

Alcan Aluminum Corporation: *See*—
Johnstone, Thomas O., 4,476,658, Cl. 52-395.000.

Alcan International Limited: *See*—
Austin, Derek T., 4,477,011, Cl. 228-173.00A.

Aldag, Arthur W., Jr., to Phillips Petroleum Company. Catalyst for skeletal isomerization. 4,477,592, Cl. 502-342.000.

Alder, Robert L., to Smith International, Inc. Valve with circulation timer. 4,476,894, Cl. 137-552.700.

Alderman, Albert D., Jr.: *See*—
Lieb, Nathaniel H.; Alderman, Albert D., Jr.; and Alago, James L., 4,477,252, Cl. 433-29.000.

Aldinio, Giuseppe; and Baggio, Giorgio, to Nordica S.p.A. Device for controlling the flex of ski and the like boots. 4,476,640, Cl. 36-121.000.

Alexius, Richard C., to Martin Marietta Corporation. High force-gain valve. 4,477,056, Cl. 251-282.000.

Alford, Peter B., to Iowa Manufacturing Company. Apparatus for ready conversion of crushing cavity configuration in a cone crusher. 4,477,031, Cl. 241-211.000.

Alfred University Research Foundation, Inc.: *See*—
Funk, James E., 4,477,259, Cl. 44-51.000.
Funk, James E., 4,477,260, Cl. 44-51.000.

Alfredson, Thomas V., to Varian Associates, Inc. Liquid chromatographic separation of hydrocarbons. 4,476,713, Cl. 73-61.10C.

Ali-Zaidi, Syed R., to Glass Containers Corporation. Process for forming rust resistant tin oxide coatings on glass containers. 4,477,494, Cl. 427-255.300.

Aligena AG: *See*—
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,477,634, Cl. 525-327.100.

Alink, Bernardus A. O., to Petrolite Corporation. Preparation of dihydrothiazoles. 4,477,674, Cl. 548-146.000.

Allan, Jonathan M.; Burton, Richard J.; and Jurock, Volker, to Becton, Dickinson and Company. Apparatus and method for controlling ultrafiltration during hemodialysis. 4,477,342, Cl. 210-87.000.

Allegheny Ludlum Steel Corporation: *See*—
Nauman, John D., 4,477,279, Cl. 75-60.000.

Allen-Bradley Company: *See*—
Schumacher, Gary L.; Struger, Odo J.; and Schultz, Ronald E., 4,477,882, Cl. 364-900.000.

Allied Corporation: *See*—
Ayer, George E., 4,477,137, Cl. 339-59.00M.
Li, Hsin L.; Misson, John D.; and Carrigan, David G., 4,476,753, Cl. 83-36.000.
Pelczarski, Walter J., 4,477,047, Cl. 248-201.000.
Stables, Wilbur L.; Cooksey, James J.; and Newell, Harry L., Jr., 4,476,729, Cl. 73-861.610.

Allis-Chalmers Corporation: *See*—
Belsanti, James F., 4,476,842, Cl. 123-563.000.

Almond, Stephen W., to Halliburton Company. Method and compositions for fracturing subterranean formations. 4,477,360, Cl. 252-8.55R.

Alps Electric Co., Ltd.: *See—*
Henmi, Shoichi; Imura, Junichi; and Moriya, Isao, 4,477,795, Cl. 338-163.000.
Yamanashi, Fumiaki; Hayashi, Yuzo; Kano, Mitsuru; Fujiwara, Yoshiyuki; and Tashiro, Yoshizo, 4,477,368, Cl. 252-299.100.

Althom-Atlantique: *See—*
Gilmer, Andre ; Romand-Monnier, Jacques; and Lejeune, Jean-Pierre, 4,477,235, Cl. 417-414.000.

Aluminum Company of America: *See—*
Brown, Melvin H., 4,477,292, Cl. 148-20.000.

Alaotto, Patrick F.; Drees, Paul A.; and Soucek, Charles A., to Inmont Corporation. Hydrosol coating compositions having improved stability. 4,477,609, Cl. 523-407.000.

America, William: *See—*
Charney, Andrew R.; Kercher, Paul W.; and America, William, 4,476,731, Cl. 73-863.730.

American Can Company: *See—*
Kubacki, Edward F.; Jacobs, Edward C.; Masciale, John M.; and Monroe, James R., 4,476,781, Cl. 101-3.00R.
O'Sullivan, Eileen F., 4,477,502, Cl. 428-35.000.

American Cyanamid Company: *See—*
Asato, Goro, 4,477,680, Cl. 564-82.000.
Floyd, Middleton B., Jr.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,477,388, Cl. 260-429.700.
Haeger, Bruce E., 4,477,452, Cl. 424-250.000.
Kazmierczak, Thomas F.; Dulina, Richard; and Petersen, Arthur W., 4,477,288, Cl. 134-19.000.

American Hoechst Corporation: *See—*
Ong, Helen H.; and Profitt, James A., 4,477,667, Cl. 546-17.000.

American Home Products Corporation: *See—*
Hon, Edward H., 4,476,871, Cl. 128-642.000.

American Hospital Supply Corporation: *See—*
Bilbrey, Robert A., 4,476,999, Cl. 222-75.000.
Liston, Max D.; Dickinson, David G.; and Stark, William A., 4,477,190, Cl. 356-418.000.

American Industries: *See—*
Bellino, Ralph R.; and McVey, Charles W., 4,476,995, Cl. 220-371.000.

American Laser Corporation: *See—*
McMahan, William H., 4,477,907, Cl. 372-64.000.

American Minechem Corporation: *See—*
Messer, Leonard, 4,477,353, Cl. 210-633.000.

AMF Inc.: *See—*
Diacont, George P., Jr.; and Grisham, James D., 4,476,792, Cl. 112-142.000.

AMP Incorporated: *See—*
Andrews, Howard W., Jr.; Billman, Timothy B.; and Cobaugh, Robert F., 4,477,138, Cl. 339-65.000.
Bowen, Terry P.; Caron, Bernard G.; Glover, Douglas W.; and Hoffer, John C., 4,477,146, Cl. 350-96.210.
Cooper, Ralph M.; and Pegram, Warren J., 4,477,142, Cl. 339-125.00R.
Cosmo, Nicola, 4,477,133, Cl. 339-17.00M.
Kees, Gerald H., Jr., 4,476,628, Cl. 29-861.000.
Moser, Jessie L.; and West, John D., 4,477,132, Cl. 339-14.00P.
Shuey, John R.; and Widener, Donald R., 4,477,022, Cl. 339-59.00M.

Anahara, Meiji; Seiki, Kazuo; and Omori, Hiroshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Air nozzle for fasciated yarn spinning. 4,476,672, Cl. 57-333.000.

Analog Data Systems: *See—*
Byrne, Paul, 4,476,723, Cl. 73-453.000.

Anatros Corporation: *See—*
Danby, Hal C.; and Ciupke, Werner W., 4,477,054, Cl. 251-122.000.

Anderle, Joseph A.; and Debs, Victor, to Levolor Lorentzen, Inc. Cord lock for a venetian blind lift cord. 4,476,909, Cl. 160-178.00C.

Anderson, Frank T., III; and Kaiser, Darold. Cutting die supporting plate apparatus. 4,476,762, Cl. 83-640.000.

Anderson Strathclyde PLC: *See—*
Graham, Robert S., 4,477,734, Cl. 307-120.000.

Anderson, Wendell G., to RCA Corporation. Switching circuit including pin diodes for impedance matching. 4,477,817, Cl. 343-861.000.

Andersson, Anders I., to Aktiebolaget Karlstads Mekaniska Werkstad. Method and apparatus for producing a multilayer paper web. 4,477,313, Cl. 162-123.000.

Ando, Hiroyuki: *See—*
Suzuki, Satoshi; and Ando, Hiroyuki, 4,477,875, Cl. 364-431.080.

Andrews, Howard W., Jr.; Billman, Timothy B.; and Cobaugh, Robert F., to AMP Incorporated. Card biasing device for card edge connectors. 4,477,138, Cl. 339-65.000.

Anabaugh, Donald L., to Wheelabrator-Frye Inc. Link and flight assembly for blast treatment apparatus. 4,476,655, Cl. 51-215.00E.

Anthony's Manufacturing Company, Inc.: *See—*
Heaney, James J., 4,477,129, Cl. 312-116.000.

Antonelli, Joseph A.; McLaughlin, Joseph E.; and Strolle, Clifford H., to Du Pont de Nemours, E. I., and Company. Air-drying high-solids coating compositions containing vinyl oxazoline esters as reactive diluents. 4,477,534, Cl. 428-461.000.

Anzenberger, Joseph F., Sr., to Stauffer Chemical Company. Remote monitoring of ester functional fluids. 4,477,572, Cl. 436-6.000.

Aoki, Kozo: *See—*
Ogawa, Akira; Aoki, Kozo; and Kamio, Takayoshi, 4,477,558, Cl. 430-384.000.

Aoyagi, Edward I., to Chevron Research Company. Fungicidal 4-substituted-5-trifluoromethyl-3-(1,2-dichloro-2-cyanovinyl thio)-1,2,4-triazoles. 4,477,459, Cl. 424-269.000.

Aoyagi, Edward I., to Chevron Research Company. Fungicidal 1-methyl-3,4-dihalo-5-alkylthiopyrazoles. 4,477,462, Cl. 424-273.00P.

Aoyagi, Naohisa: *See—*
Ishimura, Hidekazu; Kakutani, Yoshimi; and Aoyagi, Naohisa, 4,477,610, Cl. 523-414.000.

Apetrei, Constantin; Nitigus, Victor; Demeter, Elek; Radulescu, Marian; and Sachelarie, Toma, to Institutul De Cercetare Stiintifica Si Inginerie Technologica Pentru Industria Electrotehnica. Brake-motor. 4,477,743, Cl. 310-77.000.

Apital Produzioni Industriali S.p.A.: *See—*
Raspanti, Giuseppe; and Fossati, Norberto, 4,477,615, Cl. 524-100.000.

Apollo Optics & Kinematics, Inc.: *See—*
Bunch, Jesse C., 4,476,780, Cl. 100-214.000.

Appelbaum, Paul, to Jog-et, Inc. Fold-away rebound exercise device. 4,477,070, Cl. 272-70.000.

Arabian, Sandro, to Europtool Trust. Apparatus for forming portions of soap foam. 4,477,000, Cl. 222-135.000.

Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Gear-shift mechanism for power transmission units. 4,476,739, Cl. 74-475.000.

Arbogast, Clayton C. Solar energy recovery system. 4,476,853, Cl. 126-425.000.

Arcamone, Federico: *See—*
Suarato, Antonino; Penco, Sergio; and Arcamone, Federico, 4,477,444, Cl. 424-180.000.

Arcangeli, Gerald T.: *See—*
Boulton, Donald G.; and Arcangeli, Gerald T., 4,477,039, Cl. 244-53.00B.

Aren, Bjorn G. A., to Stiftelsen Prodinor. Gripping unit. 4,476,612, Cl. 24-304.000.

Arinc Research Corporation: *See—*
Russell, James L., 4,477,912, Cl. 375-1.000.

Armini, Anthony J.; and Kreisman, Wallace S., to Spire Corporation. X-Ray lithography source tube. 4,477,921, Cl. 378-34.000.

Armstrong, Charles M.; and Duke, Eddie D. Fluid contact panel. 4,477,394, Cl. 261-112.000.

Arnold, Wolfgang: *See—*
Lehmann, Jurgen; Vetter, Heinz; and Arnold, Wolfgang, 4,477,521, Cl. 428-336.000.

Arnott, Eric J. Lens implants for insertion in the human eye. 4,476,591, Cl. 3-13.000.

Arter, Nelson K.; Estabrooks, Dennis C.; and Jackson, William G., to International Business Machines Corporation. Automatic duplex document feeder. 4,477,068, Cl. 271-186.000.

Arter, William L. Wine preservation device and method. 4,477,477, Cl. 426-330.400.

Arton, Kenneth A. M.; and Rokos, George H. S., to International Standard Electric Corporation. Matrix addressing of display devices. 4,477,805, Cl. 340-784.000.

Asada, Seigo, to Matsushita Electric Industrial Co., Ltd. Video signal recording-reproducing apparatus. 4,477,837, Cl. 358-310.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Ishimura, Hidekazu; Kakutani, Yoshimi; and Aoyagi, Naohisa, 4,477,610, Cl. 523-414.000.
Nishikido, Joji; Kodama, Eiji; and Shibukawa, Mitsuru, 4,477,659, Cl. 544-21.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kawasaki, Masahiro; Okura, Zenichi; and Urano, Fumio, 4,477,161, Cl. 354-448.000.

Asai, Kuniaki: *See—*
Saito, Teruo; Asai, Kuniaki; Nakagawa, Isamu; and Kobayashi, Tadayasu, 4,477,630, Cl. 525-133.000.

Asai, Osatsugu: *See—*
Ogasahara, Hiroshi; Asai, Osatsugu; and Sato, Takashi, 4,477,689, Cl. 174-15.0CA.

Asakura, Noboru; Yanagawa, Motoo; and Tsugahara, Takatoshi, to Nissan Motor Company, Limited. Rear window structure for an automotive vehicle and a weatherstrip with a spoiler fin therefor. 4,477,115, Cl. 296-1.00S.

Asano, Katsuhiro; and Tsunehiro, Yuzuru, to Kabushi Kaisha Toyota Chuo Kenkyusho. Method of controlling inverter and system therefor. 4,477,763, Cl. 318-811.000.

Asano, Masamichi: *See—*
Iwahashi, Hiroshi; and Asano, Masamichi, 4,477,884, Cl. 365-189.000.

Asato, Goro, to American Cyanamid Company. 3-Amino-4-hydroxy(or alkoxy)phenethanolamine derivatives and pharmacologically acceptable acid addition salts thereof for increasing the growth rate and/or improving the lean meat to fat ratio of warm-blooded animals. 4,477,680, Cl. 564-82.000.

Asawa, Charles K.; Austin, Joseph W.; Barnoski, Michael K.; Jackson, Allan R.; Personick, Stewart D.; and Yao, Shi-Kay, to TRW Inc. Microbending of optical fibers for remote force measurement. 4,477,725, Cl. 250-231.00R.

Asea Aktiebolag: *See—*
Moritz, Bertil, 4,477,790, Cl. 336-60.000.

Ashizawa, Masaaki: *See—*
Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, 4,477,094, Cl. 277-235.00B.

Ashland Oil, Inc.: *See—*
Benslay, Roger M., 4,477,335, Cl. 208-113.000.
Goel, Anil B.; and Richards, Harvey J., 4,477,382, Cl. 260-398.000.

Goel, Anil B.; and Pettiford, Michael E., 4,477,385, Cl. 260-410.90R.
Ashworth, Robert A.: *See*—
Berry, William W.; Ashworth, Robert A.; and Spake, Ned B., 4,477,425, Cl. 423-485.000.
Astoin, Jacques N.; Lepage, Francis; and Fromantin, Jean-Pierre M. J., to Univablot. Oxime ethers of 1-pyridyl-3-pentanone. 4,477,453, Cl. 424-250.000.
AT&T Bell Laboratories: *See*—
Dutt, Bulusu V., 4,477,824, Cl. 357-17.000.
Fleming, James W., Jr., 4,477,580, Cl. 501-12.000.
Gibson, John M.; Poate, John M.; and Tung, Raymond T., 4,477,308, Cl. 156-603.000.
Judd, Thomas H.; King, Michael C.; Klemmer, Edmund T.; and Singer, Martin H., 4,477,697, Cl. 179-84.00T.
Lane, Michael S., 4,477,897, Cl. 370-62.000.
Spires, Dewayne A., 4,477,780, Cl. 330-265.000.
Swanson, Eric J., 4,477,782, Cl. 330-288.000.
AT&T Technologies, Inc.: *See*—
Bohannon, William D., Jr.; Kinard, Michael D.; and Schneider, Randy G., 4,477,298, Cl. 156-54.000.
Hardesty, Edwin C., 4,477,141, Cl. 339-122.00R.
Lynch, Brian; and Partus, Fred P., 4,477,273, Cl. 65-3.120.
Nis, John R.; and Spainhour, Carroll D., 4,477,244, Cl. 432-11.000.
Atia, Ali E., to Communications Satellite Corporation. Generalized dielectric resonator filter. 4,477,785, Cl. 333-202.000.
Atkins, Michael T. Quick release wheel. 4,477,121, Cl. 301-112.000.
Atkinson, Joseph W., III, to Hardinge Brothers, Inc. Collet adapter. 4,477,095, Cl. 279-1.00A.
Atlantic Richfield Company: *See*—
Emery, Leonard W., 4,476,932, Cl. 166-303.000.
Hearn, David D., 4,476,945, Cl. 175-203.000.
Atlas Paper Box Company: *See*—
Robinson, E. Montgomery, 4,476,986, Cl. 211-134.000.
Au, Alexander C., to Fairchild Camera & Instrument Corporation. Sense/restore circuit for dynamic random access memory. 4,477,886, Cl. 365-222.000.
Auerbach, Joseph; and Golec, Frederick A., Jr., to USV Pharmaceutical Corporation. Process for forming certain substituted phthalimidines. 4,477,675, Cl. 548-480.000.
Ault, Frederick K. Method for treating an oxidizable surface. 4,477,285, Cl. 134-3.000.
Aurousseau, Christian; and Odeyer, Pierre P. L., to S.N.E.C.M.A. Acceleration limiter for turbojet engine. 4,476,675, Cl. 60-39.281.
Austin, Charles W. Vane structure for arrows. 4,477,084, Cl. 273-423.000.
Austin, Derek T., to Alcan International Limited. Continuous cladding of aluminum strip. 4,477,011, Cl. 228-173.00A.
Austin, Joseph W.: *See*—
Asawa, Charles K.; Austin, Joseph W.; Barnoski, Michael K.; Jackson, Allan R.; Personick, Stewart D.; and Yao, Shi-Kay, 4,477,725, Cl. 250-231.00R.
Automated Portion Control Technology, Inc.: *See*—
Baker, Forrest E.; and Sullivan, Norman D., 4,477,003, Cl. 222-642.000.
Automatic Material Handling, Inc.: *See*—
Keller, Alex J.; and Pinto, Akiva, 4,476,611, Cl. 19-105.000.
Automotive Products plc: *See*—
Young, Alastair J., 4,476,737, Cl. 74-358.000.
Autotype International Limited: *See*—
Day, Peter M. G.; Jones, John W.; and Sperry, John A., 4,477,552, Cl. 430-175.000.
AVA International Corporation: *See*—
Akkerman, Neil H., 4,477,104, Cl. 285-18.000.
Avco Corporation: *See*—
Hoffman, Paul L.; and Manente, Joseph C., Jr., 4,477,089, Cl. 277-153.000.
Avco Everett Research Laboratory, Inc.: *See*—
Stickler, David B., 4,477,332, Cl. 208-8.00R.
Avera, F. Lee, to Kuehn, Jack W., Sr. Peanut flavoring compatible with water based food systems. 4,477,482, Cl. 426-632.000.
Averbukh, Anatoly B.: *See*—
Ivanov, Jury P.; Averbukh, Anatoly B.; Evstafiev, Evgeny A.; and Tarasov, Alexandr E., 4,476,797, Cl. 114-65.00R.
Avery, James M.; and Hoyer, Elmer A., to NCR Corporation. Clipped speech-linear predictive coding speech processor. 4,477,925, Cl. 381-43.000.
Aviv, Gershon: *See*—
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,477,634, Cl. 525-327.100.
Ayer, George E., to Allied Corporation. Zero insertion force connector for flat cable. 4,477,137, Cl. 339-59.00M.
Ayers, William M.; Maheshwary, Ashok K.; and Young, Peter J., to Halliburton Company. Open sea skimmer barge. 4,477,348, Cl. 210-242.300.
Azuchi, Yukihiro, to Murata Manufacturing Co., Ltd. Rotary electric component. 4,477,859, Cl. 361-278.000.
B & b Bologna di Basaglia Rubens e Bollina Ezio s.n.c.: *See*—
Basaglia, Rubens; and Bollina, Ezio, 4,476,827, Cl. 123-276.000.
B. F. Goodrich Company, The: *See*—
Lai, John T.; and Son, Pyong-Nae, 4,477,665, Cl. 544-384.000.
Lattimer, Mary B.; Weber, Carl D.; and Hardt, Zbigniew R., 4,477,619, Cl. 524-171.000.
Rundo, John R., 4,477,036, Cl. 242-67.200.
Babcock & Wilcox Company, The: *See*—
Giachino, Joseph M.; and Keyes, Marion A., IV, 4,477,245, Cl. 431-78.000.
Roberts, Robert C., 4,477,804, Cl. 340-747.000.
Babler, Fridolin; and Weissmuller, Adolf, to Ciba-Geigy Corporation. Compositions containing graphite. 4,477,608, Cl. 523-215.000.
Backus, George S., to Consolidated Olympic Corporation. Integrated multiple purpose universal ship hull and replacement module system. 4,476,798, Cl. 114-77.00R.
Badzinski, John D.: *See*—
Sorenson, Paul D.; Dickson, Dale A.; McNichols, Larry A.; and Badzinski, John D., 4,476,873, Cl. 128-660.000.
Baer, Stephen C., to Zomeworks Corporation. Gas spring solar tracker. 4,476,854, Cl. 126-425.000.
Baggio, Giorgio: *See*—
Aldinio, Giuseppe; and Baggio, Giorgio, 4,476,640, Cl. 36-121.000.
Bahnson Company, The: *See*—
Nijhawan, Pramodh; and Schaltenbrand, Eugene D., 4,477,910, Cl. 373-9.000.
Bailey, Larry E.; and Morello, Edward B., to Sheller-Globe Corporation. Utilization of plastic films to control gas pressure and reduce foam in cellular foam products. 4,477,504, Cl. 428-138.000.
Baker, Bruce W. Board game device having plural tiers. 4,477,080, Cl. 273-241.000.
Baker, Forrest E.; and Sullivan, Norman D., to Automated Portion Control Technology, Inc. Condiment dispensing system. 4,477,003, Cl. 222-642.000.
Baker International Corporation: *See*—
Beimgraben, Herbert W., 4,476,944, Cl. 175-65.000.
Baker, Kenneth J.; Buck, Keith E.; Chase, Irving C.; Fraser, Robert B.; and Miles, Clive, to Thoratec Laboratories Corporation. Flow controller. 4,476,708, Cl. 73-23.000.
Baker Oil Tools, Inc.: *See*—
Brooks, Robert T., 4,476,933, Cl. 166-324.000.
Balash, Frederick A.; and Caton, Mary T., to Rogers Corporation. Tactile membrane keyboard with elliptical tactile key elements. 4,477,700, Cl. 200-5.00A.
Ball Corporation: *See*—
Weiss, Michael A., 4,477,813, Cl. 343-700.0MS.
Ballinger, Paul V. Strata rock bucket. 4,476,641, Cl. 37-118.00R.
Balz, Helmut. Method and apparatus for a regulated heat transfer from a primary steam network to a heat consumer. 4,477,021, Cl. 237-67.000.
Bamberg, Joe T.: *See*—
Kohn, Gustave K.; and Bamberg, Joe T., 4,477,672, Cl. 546-294.000.
Band, Elliot I., to Stauffer Chemical Company. Supported catalyst for polymerization of olefins. 4,477,587, Cl. 502-111.000.
Bandy, Stephen D. Sails. 4,476,799, Cl. 114-103.000.
Bang, Borje: *See*—
Bjorkman, Lars; and Bang, Borje, 4,476,606, Cl. 15-268.000.
Banks, Thomas M.; Ruckel, Raymond R.; Spencer, Samuel F.; and Walker, John Q., to International Business Machines Corporation. Wet needle sampler for use with a gas chromatograph. 4,476,734, Cl. 73-864.160.
Barabanov, Stanislav D.: *See*—
Ziman, Yan L.; Kottsov, Vladimir A.; Chesnokov, Jury M.; Dunaev, Boris S.; Drokhanov, Alexei N.; Kraush, Klavdia A.; and Barabanov, Stanislav D., 4,477,829, Cl. 358-1.000.
Barber, Brian D.: *See*—
Crawford, William B.; and Barber, Brian D., 4,476,906, Cl. 144-116.000.
Barchas, Myron: *See*—
Suffis, Robert; and Barchas, Myron, 4,477,431, Cl. 424-66.000.
Barker, John M., to Gould Inc. Fluid temperature sensor. 4,476,877, Cl. 128-736.000.
Barmag Barmer Maschinenfabrik AG: *See*—
Schwelm, Hans, 4,476,893, Cl. 137-486.000.
Barnett, Allen M.; Catalano, Anthony W.; Dalal, Vikram L.; Masi, James V.; Meakin, John D.; and Hall, Robert B., to University of Delaware, The. Photovoltaic cells employing zinc phosphide. 4,477,688, Cl. 136-258.000.
Barnoski, Michael K.: *See*—
Asawa, Charles K.; Austin, Joseph W.; Barnoski, Michael K.; Jackson, Allan R.; Personick, Stewart D.; and Yao, Shi-Kay, 4,477,725, Cl. 250-231.00R.
Barritault, Denis: *See*—
Courtois, Yves; Barritault, Denis; and Pouliquen, Yves, 4,477,435, Cl. 424-95.000.
Barro, Giovanni, to Fratelli Barro, Giovanni E Luigi, S.r.L. Parcel rack for use on a vehicle such as a bicycle. 4,477,004, Cl. 224-39.000.
Barry, Graham Charles: *See*—
Tomlinson, Roderick P. J., 4,477,593, Cl. 346-205.000.
Barry, Leon G.; and Rieman, Willis, to Fasco Controls Corporation. Engine oil level sensor. 4,476,714, Cl. 73-118.000.
Basaglia, Rubens; and Bollina, Ezio, to B & b Bologna di Basaglia Rubens e Bollina Ezio s.n.c. Plant for supplying diesel cycle engines with diesel oil and with a mixture of diesel oil and gas. 4,476,827, Cl. 123-276.000.
BASF Aktiengesellschaft: *See*—
Grosskinsky, Otto-Alfred; Frommer, Elmar; Rapp, Gunther; and Thomas, Erwin, 4,477,424, Cl. 423-387.000.
Mayer, Udo; Hahn, Erwin; and Jesse, Joachim, 4,477,381, Cl. 260-392.000.
Steiner, Gerd; Friedrich, Ludwig; and Lenke, Dieter, 4,477,451, Cl. 424-248.540.

BASF Farben & Fasern AG: *See*—
Geist, Michael; and Diefenbach, Horst, 4,477,642, Cl. 528-61.000.
Hegemann, Gunther; and Miedeck, Karin, 4,477,653, Cl. 528-289.000.

BASF Farben & Fasern AG: *See*—
Diefenbach, Horst; and Geist, Michael, 4,477,530, Cl. 428-413.000.

BASF Wyandotte Corporation: *See*—
Login, Robert B., 4,477,525, Cl. 428-395.000.

Basili, Robert A., to Plastic Reel Corporation Of America. Slip and skid resistant reel carrier. 4,476,990, Cl. 220-83.000.

Baston, Nathan I.: *See*—
Lowery, James O.; Thomas, O. Leon; Baston, Nathan I.; Smith, Darrell L.; Jiles, Walter K.; and Starnes, R. Emory, Jr., 4,477,769, Cl. 324-54.000.

Bath, William R.; and Be'er, Danny. Hydraulic crane hoist control lever velocity limiting device. 4,476,966, Cl. 188-280.000.

Battelle Development Corp.: *See*—
Wilkinson, William H., 4,477,396, Cl. 261-140.00R.

Battelle Memorial Institute: *See*—
Harmer, Alan L., 4,477,724, Cl. 250-227.000.

Battice, David R., to Dow Corning Corporation. High resiliency molded urethane foams containing high levels of graft copolymer polyols. 4,477,601, Cl. 521-111.000.

Bauer, Bernhard: *See*—
Leuner, Hilmar; Dobhan, Herbert; Bauer, Bernhard; and Olschewski, Armin, 4,476,913, Cl. 164-346.000.

Bauer, Hartmut K.; and Otte, Ernst A. W., to Didier Engineering GmbH. Process for separating, especially in multiple stages, acid components such as CO_2, HCN and specifically H_2S, from gases, especially from coke oven gases, by means of ammonia recirculation scrubbing. 4,477,420, Cl. 423-234.000.

Bauer, Klaus: *See*—
Willms, Lothar; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,477,276, Cl. 71-94.000.

Bauman, William C.: *See*—
Lee, John M.; Bauman, William C.; Wolcott, Richard A.; and Burba, John L., III, 4,477,597, Cl. 521-28.000.

Baumann, Heinz; and Gerlach, Hans-Jurgen, to Siemens Aktiengesellschaft. X-ray diagnostic system for angiographic radiographs. 4,477,923, Cl. 378-95.000.

Baur, Josef: *See*—
Lossack, Edgar; Spriestersbach, Jochen; Baur, Josef; and Schwab, Wilfried, 4,476,911, Cl. 164-65.000.

Bayer Aktiengesellschaft: *See*—
Ersfeld, Heinrich; and Schulte, Klaus, 4,477,191, Cl. 366-77.000.
Reiss, Gerhard, 4,477,267, Cl. 55-68.000.

Bayerische Motoren Werke AG: *See*—
Rathgeber, Gerhard, 4,477,018, Cl. 236-1.00B.

Bean, Harley F., to Mead Corporation, The. Offset stacker and method. 4,477,218, Cl. 414-36.000.

Bear Medical Systems, Inc.: *See*—
Burns, Henry L.; and Peterson, Erik W., 4,476,707, Cl. 73-4.00R.

Beauchot, Pierre, to Fermod. Device for suspending a slidable sealed door. 4,476,652, Cl. 49-235.000.

Beaumont, David A.; and King, Michael A., to Marconi Company Limited, The. Scan conversion circuit. 4,477,834, Cl. 358-113.000.

Beauregard, LeR. Combination arrowhead removing and muzzle-loading tool. 4,476,598, Cl. 7-170.000.

Beck-Noma Illinois Inc.: *See*—
Kumasaka, Haruo, 4,477,247, Cl. 431-146.000.

Becton, Dickinson and Company: *See*—
Allan, Jonathan M.; Burton, Richard J.; and Jurock, Volker, 4,477,342, Cl. 210-87.000.

Bedson, Joseph H., Jr.: *See*—
Castelbaum, Leonard; Ostrowski, Joseph M.; and Bedson, Joseph H., Jr., 4,477,108, Cl. 285-149.000.

Beecham Group p.l.c.: *See*—
Corbett, David F.; Brown nee Davis, Pamela; and Ponsford, Roger J., 4,477,662, Cl. 544-212.000.

Be'er, Danny: *See*—
Bath, William R.; and Be'er, Danny, 4,476,966, Cl. 188-280.000.

Beimesch, Bruce J.; Schnur, Nicholas E.; and Hughes, Clarence J., Jr., to National Distillers and Chemical Corporation. Di- and tripentaerythritol esters of isostearic acid. 4,477,383, Cl. 260-410.600.

Beimgraben, Herbert W., to Baker International Corporation. Method of providing a fluid seal in downhole drilling apparatus. 4,476,944, Cl. 175-65.000.

Belart, Juan; Kircher, Dieter; Budecker, Ludwig; and Obersteiner, Georg, to ITT Industries, Inc. Hydraulic brake system having an antiskid system. 4,477,125, Cl. 303-116.000.

Bell, Lon E.; and Gruber, William P., to Technar Incorporated. PTC thermistor controlled electric diesel fuel heater. 4,477,715, Cl. 219-205.000.

Bellino, Ralph R.; and McVey, Charles W., to American Industries. Breather cap. 4,476,995, Cl. 220-371.000.

Beloit Corporation: *See*—
Justus, Edgar J.; Stedile, Udino; and Bollani, Umberto, 4,476,637, Cl. 34-119.000.

Belsanti, James F., to Allis-Chalmers Corporation. Intercooler damper support. 4,476,842, Cl. 123-563.000.

Ben-Yehuda, Avram. Flow control valve. 4,477,051, Cl. 251-30.000.

Bender, Dean R.; Karady, Sandor; and Rothauser, Theresa, to Merck & Co., Inc.. Process for 5-methyl-10,11-dihydro-5H-dibenzo[a,d]-cyclohepten-5,10-imine. 4,477,668, Cl. 546-72.000.

Bendiberica S.A.: *See*—
Bofill, Joaquim F., 4,476,962, Cl. 188-71.100.

Bendix Corporation, The: *See*—
Johnson, Edwin A.; and Leung, Chun K., 4,476,833, Cl. 123-436.000.
Walter, Chris J.; and Brumm, Gerald A., 4,477,802, Cl. 340-727.000.

Benfield, Sherwood G., to Unified Technologies, Inc. Solar heating device. 4,476,855, Cl. 126-426.000.

Benin, Joshua, to Du Pont de Nemours, E. I., and Company. Cutting means magazine for a sterile docking apparatus. 4,476,631, Cl. 30-92.000.

Benoit, Gordon L.: *See*—
Reimann, George J.; Benoit, Gordon L.; Gavin, James R.; and Schneider, Michael A., 4,476,979, Cl. 206-554.000.

Benslay, Roger M., to Ashland Oil, Inc. Separation of regenerated catalyst from combustion products. 4,477,335, Cl. 208-113.000.

Bentkowski, James E., to Scientific Resources, Inc. Continuously monitoring and self-cleaning liquid density measurement system. 4,476,722, Cl. 73-434.000.

Berardi, Eugene J.: *See*—
Liberto, Samuel J.; Meli, James; and Berardi, Eugene J., 4,476,774, Cl. 98-2.130.

Berger, Dieter: *See*—
Vogel, Peter; Braun, Hans-Peter; Berger, Dieter; and Werner, Wolfgang, 4,477,575, Cl. 436-170.000.

Berger, James K., to Pioneer Magnetics, Inc. Magnetic disc drive head alignment system. 4,477,849, Cl. 360-77.000.

Berger, Jean L.; and Descure, Pierrick, to Thomson-CSF. Charge transfer photosensitive device. 4,477,835, Cl. 358-213.000.

Berger, Laurent; and Tigreat, Paul, to Euromask. Optical imaging apparatus. 4,477,185, Cl. 356-152.000.

Bergna, Horacio E.; and Kirkland, Joseph J., to Du Pont de Nemours, E. I., and Company. Process for preparing superficially porous supports for chromatography and catalysts. 4,477,492, Cl. 427-215.000.

Bergsten, Ronald E.: *See*—
Fanselow, Dan L.; Cobb, Sanford, Jr.; and Bergsten, Ronald E., 4,476,593, Cl. 5-417.000.

Bergwerksverband GmbH: *See*—
Knoblauch, Karl; and Heimbach, Heinrich, 4,477,052, Cl. 251-57.000.

Berman, Paul A., to Westinghouse Electric Corp. Power generating plant employing a reheat pressurized fluidized bed combustor system. 4,476,674, Cl. 60-39.182.

Bernheim, Willy: *See*—
Deiner, Hans; Mosch, Franz; Sandner, Bernhard; and Bernheim, Willy, 4,477,498, Cl. 427-389.900.

Berni, Albert J., to Shell Oil Company. Low noise mounting for accelerometer used in marine cable. 4,477,887, Cl. 367-20.000.

Berry, John: *See*—
O'Driscoll, Peter F.; Crowe, Gerald E.; and Berry, John, 4,477,024, Cl. 239-265.110.

Berry, William W.; Ashworth, Robert A.; and Spake, Ned B., to Florida Progress Corporation. Production of anhydrous hydrogen fluoride from low-grade metallic fluorides and sulfuric acid. 4,477,425, Cl. 423-485.000.

Bertolazzi, Ugo, to Honeywell Information Systems Inc. Continuous form for printer. 4,477,103, Cl. 283-62.000.

Berwaldt, Oren E.: *See*—
Mullhaupt, Joseph T.; and Berwaldt, Oren E., 4,477,418, Cl. 423-219.000.

Best, Michael J. A.: *See*—
Morrill, Charles D.; and Best, Michael J. A., 4,477,205, Cl. 405-169.000.

Bezchastnov, Gennady A.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Turutin, Veniamin S.; Bezchastnov, Gennady A.; and Telezhnikov, Jury F., 4,477,690, Cl. 174-15.00C.

Bianchin, Bernard: *See*—
Perrin, Bernard; Bianchin, Bernard; and Sauret, Georges, 4,477,359, Cl. 210-785.000.

Bickel, Hans: *See*—
Scartazzini, Riccardo; and Bickel, Hans, 4,477,658, Cl. 544-16.000.

Bienvenu, Raymond: *See*—
Lacroix, Marc; and Bienvenu, Raymond, 4,476,997, Cl. 221-171.000.

Bieringer, Hermann: *See*—
Willms, Lothar; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,477,276, Cl. 71-94.000.

Bifok AB: *See*—
Carlson, Henning L., 4,477,186, Cl. 356-246.000.

Biggs, James W.; and Maringer, Melvin F., to National Distillers and Chemical Corporation. Flame retardant crosslinked polyolefin insulation material. 4,477,523, Cl. 428-389.000.

Bihn, Daniel, to Intermedics, Inc. Pacer analyzer. 4,476,869, Cl. 128-419.0PT.

Bijker, Anno: *See*—
Pons, Dick A.; and Bijker, Anno, 4,477,623, Cl. 524-710.000.

Bikales, Victor W. Structure with composite members. 4,476,663, Cl. 52-730.000.

Bilbrey, Robert A., to American Hospital Supply Corporation. Automated liquid dispenser. 4,476,999, Cl. 222-75.000.

Billman, Timothy B.: *See*—
Andrews, Howard W., Jr.; Billman, Timothy B.; and Cobaugh, Robert F., 4,477,138, Cl. 339-65.000.

Bina, Wenzel: *See*—
Zorn, Helmut; Spiess, Karl; and Bina, Wenzel, 4,477,714, Cl. 219-149.000.

Biodata S.p.A.: *See*—
Ricci, Giorgio; and Federici, Giorgio, 4,477,566, Cl. 435-16.000.

Bird, Perry L., to Champion International Corporation. Paper roll splitter attachment for fork lift truck. 4,476,761, Cl. 83-614.000.

Bissot, Thomas C.; and Silva, Raimund H., to Du Pont de Nemours, E. I., and Company. Sacrificial reinforcements in cation exchange membrane. 4,477,321, Cl. 204-98.000.

Bjorklund, Jan M. V., to U.S. Philips Corporation. Activateable battery. 4,477,543, Cl. 429-115.000.

Bjorkman, Lars; and Bang, Borje, to Promovo AB. Wall-mounted foldable airing or carpet-beating stand. 4,476,606, Cl. 15-268.000.

Black & Decker, Inc.: *See*—
Hurn, Richard L.; Harris, Gregory C.; and Cox, Herman P., 4,476,602, Cl. 15-28.000.

Blase, John G.: *See*—
Blase, Robert; and Blase, John G., 4,477,537, Cl. 428-577.000.

Blase, Robert; and Blase, John G., to Blase Tool and Manufacturing Co., Inc. Method for producing burr-free blanks and the blanks produced thereby. 4,477,537, Cl. 428-577.000.

Blase Tool and Manufacturing Co., Inc.: *See*—
Blase, Robert; and Blase, John G., 4,477,537, Cl. 428-577.000.

Bliznik, Kenneth E.: *See*—
Verboom, Gilles M. L.; Bliznik, Kenneth E.; and Welsh, Thomas L., 4,477,365, Cl. 252-156.000.

Block, Charles; and Mintz, Leon, to Joseph Galkin Corporation. Cutting system. 4,476,760, Cl. 83-582.000.

Boari, Gianfranco: *See*—
Liberti, Lorenzo; Boari, Gianfranco; and Passino, Roberto, 4,477,355, Cl. 210-665.000.

Boaz, Premakaran T., to Ford Motor Company. Method of applying an opaque screening area. 4,477,486, Cl. 427-54.100.

BOC Group, Inc., The: *See*—
Madsen, Scott T.; and Johanson, Ralph E., 4,476,686, Cl. 62-63.000.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See*—
Chlosta, Wolfgang; and Pospisil, Peter, 4,476,733, Cl. 73-863.910.

Bodytone Limited: *See*—
Brown, Peter L.; Fitzpatrick, Patrick C.; and Lloyd, Frederick W., 4,477,071, Cl. 272-72.000.

Boehringer Mannheim GmbH: *See*—
Vogel, Peter; Braun, Hans-Peter; Berger, Dieter; and Werner, Wolfgang, 4,477,575, Cl. 436-170.000.

Boeing Company, The: *See*—
Burkam, John E., 4,477,225, Cl. 416-134.00A.
Darcy, Kevin A.; and Faithfull, Terence F. H., 4,477,044, Cl. 244-223.000.
Duffy, Brian J.; Gratz, Eugene J.; Potter, Steven E.; and Power, Royal A., 4,477,228, Cl. 416-241.00A.

Bofill, Joaquim F., to Bendiberica S.A. Disc brake having a sliding yoke. 4,476,96., Cl. 188-71.100.

Boger, Joshua S.; and Veber, Daniel F., to Merck & Co., Inc. Renin inhibitors containing an n-terminal disulfide cycle. 4,477,440, Cl. 424-177.000.

Boger, Joshua S.; and Veber, Daniel F., to Merck & Co., Inc. Renin inhibitors containing a C-terminal disulfide cycle. 4,477,441, Cl. 424-177.000.

Bohannon, William D., Jr.; Kinard, Michael D.; and Schneider, Randy G., to AT&T Technologies, Inc. Cable shielding method and apparatus. 4,477,298, Cl. 156-54.000.

Bohmer, Bertram: *See*—
Knips, Ulrich; Bohmer, Bertram; and Herzberg, Roland, 4,477,380, Cl. 260-385.000.

Boles, Joel L.; and Mancilias, Gene, to Hughes Tool Company. Water control well treating solution and method. 4,476,931, Cl. 166-294.000.

Bollani, Umberto: *See*—
Justus, Edgar J.; Stedile, Udino; and Bollani, Umberto, 4,476,637, Cl. 34-119.000.

Bollina, Ezio: *See*—
Basaglia, Rubens; and Bollina, Ezio, 4,476,827, Cl. 123-276.000.

Boltze, Karl-Heinz; and Lehnen, Hans D., to Troponwerke GmbH & Co. KG. Process for the preparation of 1-(4-chlorobenzoyl)-5-methoxy-2-methyl-3-indoleacetoxyacetic acid. 4,477,677, Cl. 548-501.000.

Bom, Cornelis J. G.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,476,666, Cl. 56-13.600.

Bonacorsi, Jerry, to Rockford Products Corporation. Drill and thread forming screw. 4,477,217, Cl. 411-387.000.

Bonerb, Timothy C.; and Bonerb, Vincent C. Side unloading bin for storing and discharging free-flowing granular material. 4,476,998, Cl. 222-61.000.

Bonerb, Vincent C.: *See*—
Bonerb, Timothy C.; and Bonerb, Vincent C., 4,476,998, Cl. 222-61.000.

Bonissone, Giancarlo: *See*—
Mulas, Piero; and Bonissone, Giancarlo, 4,476,891, Cl. 137-270.000.

Bonney, Warren J., to Warner-Lambert Company. Magnetic stirring apparatus and method. 4,477,192, Cl. 366-274.000.

Bonvallet, Duane J., to General Motors Corporation. Hypocyclic rolling contact rocker arm and pivot. 4,476,822, Cl. 123-90.410.

Bopp, Kenneth C.; Gooden, Judith L.; and Kulkarni, Narayan M., to GTE Communications Products Corporation. Process for making transistors with doped oxide densification. 4,476,621, Cl. 29-571.000.

Borcher, Thomas A., Sr.: *See*—
Wong, Louis F.; Sterling, Rosstain F.; and Borcher, Thomas A., Sr., 4,477,363, Cl. 252-134.000.

Borg-Warner Corporation: *See*—
Okubo, Howard S.; Albertson, Clarence E.; and Nibert, Roger K., 4,477,605, Cl. 523-155.000.

Borio, Richard W.; and Goodstine, Stephen L., to Combustion Engineering, Inc. Method of feeding particulate material to a fluidized bed. 4,476,790, Cl. 110-245.000.

Borras, Jaime A.; and Gonzalez, Ruben J., to Motorola, Inc. Range control circuit for counter to be used in a frequency synthesizer. 4,477,919, Cl. 377-47.000.

Borsig GmbH: *See*—
Lachmann, Helmut; and Lange, Bernd, 4,476,888, Cl. 137-102.000.

Bortkevicius, Jonas: *See*—
Schoonmaker, C. Donald; and Bortkevicius, Jonas, 4,477,473, Cl. 426-231.000.

Bose, Sanjay K., to General Electric Company. Method for random-access radio-frequency data communications. 4,477,809, Cl. 340-825.540.

Bouju, Maurice; and Charvet, Jean-Louis, to Compagnie Generale des Etablissements Michelin. Process for holding together the wires of a package bead ring for tires. 4,477,301, Cl. 156-136.000.

Boulton, Donald G.; and Arcangeli, Gerald T., to McDonnell Douglas Corporation. Vented cowl variable geometry inlet for aircraft. 4,477,039, Cl. 244-53.00B.

Boutsicaris, Stephen P., to Firestone Tire & Rubber Company, The. Lignin reinforced synthetic rubber. 4,477,612, Cl. 524-76.000.

Bovenkerk, Harold P., to General Electric Company. Method of dressing a plated cubic boron nitride grinding wheel. 4,476,656, Cl. 51-325.000.

Bowen, James B., to Steel Heddle Manufacturing Company. Composite heddle rod. 4,476,900, Cl. 139-91.000.

Bowen, Terry P.; Caron, Bernard G.; Glover, Douglas W.; and Hoffer, John C., to AMP Incorporated. Optical waveguide connector. 4,477,146, Cl. 350-96.210.

Bowlds, Patsy A.; Dunn, David P.; Fathergill, Rex D.; Findlay, Hugh T.; and Stafford, Donald W., to International Business Machines Corporation. Modified resistive layer in thermal transfer medium having lubricating contact graphite coating. 4,477,198, Cl. 400-120.000.

Boyadjieff, George I.; and Campbell, Andrew B., to Varco International, Inc. Jacking mechanism supported by a wellhead. 4,476,936, Cl. 166-383.000.

Boyce, Harold L. Dual purpose refrigerant connector. 4,476,892, Cl. 137-322.000.

Boylan, Francis J.: *See*—
Kavchok, Ronald W.; and Boylan, Francis J., 4,477,370, Cl. 252-321.000.

Boylance, Donald C.: *See*—
Ronden, Clifford P.; and Boylance, Donald C., 4,477,337, Cl. 208-188.000.

BPB Industries Public Limited Company: *See*—
Pilgrim, Thomas A., 4,477,300, Cl. 156-44.000.

Braband, Edward C.; and Walsh, Frank R., to Xerox Corporation. Directive diagnostics. 4,477,901, Cl. 371-15.000.

Bradbury, Bernard G., to Rexnord Inc. Continuous article handling conveyor. 4,476,974, Cl. 198-832.000.

Brady, Joseph A.: *See*—
Mortlock, Clarence E.; Brady, Joseph A.; and Shapiro, Marvin, 4,477,845, Cl. 360-26.000.

Brandenburger, Allen M., to Container Corporation of America. Triangular carton and opening means therefor. 4,477,014, Cl. 229-22.000.

Brandl, Harald; Dolc, Reinhard; and Kammerhofer, Klaus, to voest-Alpine Aktiengesellschaft. Monitoring equipment which swivels into and out of a traveling line. 4,477,722, Cl. 250-222.100.

Brandt & Associates, Inc.: *See*—
Brandt, Robert H.; and Hoodlebrink, Merlin P., 4,477,350, Cl. 210-387.000.

Brandt, Robert H.; and Hoodlebrink, Merlin P., to Brandt & Associates, Inc. Liquid filtering apparatus. 4,477,350, Cl. 210-387.000.

Brandwein, Harvey: *See*—
Deutsch, Alice; Brandwein, Harvey; Platt, Herbert; Hunter, Dianne M.; Dubitsky, Andrew; and Durham, Susan M., 4,477,576, Cl. 436-500.000.

Brashears, David F.; Elliott, Emanuel J.; and Butler, Theodore G., to Mechtron International Corporation. Asphalt recycle plant and method. 4,477,250, Cl. 432-3.000.

Braswell, Richard R. Quick release storage battery closure assembly. 4,477,542, Cl. 429-87.000.

Braun, Ernst: *See*—
Braun, Gert; Braun, Ernst; and Herwig, Walthorst, 4,477,119, Cl. 299-34.000.

Braun, Gert; Braun, Ernst; and Herwig, Walthorst, to Halbach & Braun Maschinenfabrik GmbH & Co. Planing machine for underground mining with a cutter in the transition range from longwall to drift, particularly for a simultaneously mined drift. 4,477,119, Cl. 299-34.000.

Braun, Hans-Peter: *See*—
Vogel, Peter; Braun, Hans-Peter; Berger, Dieter; and Werner, Wolfgang, 4,477,575, Cl. 436-170.000.

Brealey, Robert H., to General Electric Company. High voltage terminal bushing for electrical apparatus. 4,477,692, Cl. 174-31.00R.

Breitbach, Johnnie J. Flue gas heat recovery apparatus for a forced air home heating system. 4,477,019, Cl. 236-10.000.

Brennan, Francis T.; Sosnowski, Genevieve F.; and Weinstock, Joseph, to SmithKline Beckman Corporation. Method for producing diuresis using m-amino-α-methylphenethylamine. 4,477,470, Cl. 424-330.000.

Bricker, Robert W.; Pease, Timothy K.; Pease, Michael G.; and Kirby, Jarvis, to Pease Machine & Tool, Inc. Apparatus of inserting wedges into the slots of a magnetic core. 4,476,625, Cl. 29-734.000.

Bridges, Charles D.; Karr, Michael A., Jr.; and Morrison, Bert L., to Gray Tool. Fire resistant connections embodying heat transfer means. 4,477,085, Cl. 277-22.000.

Bridges, Jack E.; and Taflove, Allen, to IIT Research Institute. Method and apparatus for mitigation of radio frequency electric field peaking in controlled heat processing of hydrocarbonaceous formations in situ. 4,476,926, Cl. 166-248.000.

Bridgestone Tire Company Limited: *See*—
Sato, Susumu; Onda, Masaru; and Ikegami, Mikihiko, 4,477,621, Cl. 524-496.000.

Briese, Leonard A. Rotary tool cutting cartridge. 4,477,211, Cl. 407-7.000.

Brigham Young University: *See*—
Izatt, Reed M.; Christensen, James J.; and Hawkins, Richard T., 4,477,377, Cl. 252-631.000.

Brill, Jack N.: *See*—
Wheeler, James R.; Brill, Jack N.; and Miller, Lee E., 4,477,546, Cl. 429-211.000.

BroadCom, Incorporated: *See*—
Gruenberg, Elliot L., 4,477,900, Cl. 370-112.000.

Broeksema, Egbert; and Smeets, Arnoldus A., to U.S. Philips Corporation. Optically readable information disk and method of manufacturing same. 4,477,328, Cl. 204-159.230.

Brogdex Company: *See*—
Lewis, Philip J., 4,477,483, Cl. 427-8.000.

Broki, Stanley S.: *See*—
Nossen, Steve J.; Broki, Stanley S.; and McGuire, Kenyon E. B., 4,477,918, Cl. 377-37.000.

Broman, Donald E., to Outboard Marine Corporation. Seat-brake including lockout. 4,476,964, Cl. 188-109.000.

Brooks, Robert T., to Baker Oil Tools, Inc. Lubricator valve apparatus. 4,476,933, Cl. 166-324.000.

Brown, Daniel G.; and Motsinger, Donald L., to PPG Industries, Inc. Aqueous sizing composition for glass fibers for use on chopped glass fibers. 4,477,524, Cl. 428-391.000.

Brown, Frederick J.: *See*—
Putman, Thomas H.; Sweetana, Andrew S., Jr.; and Brown, Frederick J., 4,477,792, Cl. 336-180.000.

Brown, Henry M., Jr.; and Fredette, Andrew J., to Dana Corporation. Electromagnetic brake with cam release. 4,476,965, Cl. 188-171.000.

Brown, Melvin H., to Aluminum Company of America. Three-step aging to obtain high strength and corrosion resistance in Al-Zn-Mg-Cu alloys. 4,477,292, Cl. 148-20.000.

Brown nee Davis, Pamela: *See*—
Corbett, David F.; Brown nee Davis, Pamela; and Ponsford, Roger J., 4,477,662, Cl. 544-212.000.

Brown, Peter L.; Fitzpatrick, Patrick C.; and Lloyd, Frederick W., to Bodytone Limited. Convertible rowing exercising apparatus. 4,477,071, Cl. 272-72.000.

Brown, Ronald T. Shackle pin locking construction. 4,476,673, Cl. 59-86.000.

Brown & Williamson Tobacco Corporation: *See*—
Gravely, Lawrence E.; and Geiss, Vernon L., 4,476,881, Cl. 131-308.000.
Luke, John A., 4,476,882, Cl. 131-336.000.

Bruder, Alan H., to Polaroid Corporation. Intercell connector for lithium batteries. 4,477,544, Cl. 429-160.000.

Brugger, Hans, deceased; and Brugger, Wilhelmina B., Administratrix. Windmill energy system. 4,476,831, Cl. 126-247.000.

Brugger, Wilhelmina B., Administratrix: *See*—
Brugger, Hans, deceased; and Brugger, Wilhelmina B., Administratrix, 4,476,851, Cl. 126-247.000.

Brumbaugh, Charles T.; Pittenger, Robert L.; and Klees, Robert M., to United States of America, Air Force. Dual mode radio frequency-infrared frequency system. 4,477,814, Cl. 343-725.000.

Brumm, Gerald A.: *See*—
Walter, Chris J.; and Brumm, Gerald A., 4,477,802, Cl. 340-727.000.

Brumm, Richard S., to Grove Valve and Regulator Company. Orifice meter with pressure venting and equalizing safety device. 4,476,730, Cl. 73-861.610.

Brunner, Anton; and Rieskamp, Klaus, to Siemens Aktiengesellschaft. Radome for generating circular polarized electromagnetic waves. 4,477,815, Cl. 343-756.000.

Brych, Heinz. Pliers for punching cards or tickets. 4,476,633, Cl. 30-363.000.

Bryson, John W., to Kliklok Corporation. Method and apparatus for turning filled cartons with positive assist. 4,476,972, Cl. 198-415.000.

Buck, Keith E.: *See*—
Baker, Kenneth J.; Buck, Keith E.; Chase, Irving C.; Fraser, Robert B.; and Miles, Clive, 4,476,708, Cl. 73-23.000.

Buck, Manfred; Muller, Frank; and Wanner, Karl, to Robert Bosch GmbH. Motor-driven hand-held percussion tool. 4,476,941, Cl. 173-117.000.

Buck, Robert J., to Electronic Mail Corporation of America. Microprocessor operated telecommunications interface for a terminal of an automatic teletypewriter switching service. 4,477,695, Cl. 178-3.000.

Budecker, Ludwig: *See*—
Belart, Juan; Kircher, Dieter; Budecker, Ludwig; and Obersteiner, Georg, 4,477,125, Cl. 303-116.000.

Budnicki, Barbara A., executrix: *See*—
Budnicki, Xavier B.; and Budnicki, Barbara A., executrix, 4,476,840, Cl. 123-557.000.

Budnicki, Xavier B.; and Budnicki, Barbara A., executrix. Evaporation chamber for fuel delivery systems. 4,476,840, Cl. 123-557.000.

Bunch, Jesse C., to Apollo Optics & Kinematics, Inc. Cube press. 4,476,780, Cl. 100-214.000.

Bundy, Gordon L., to Upjohn Company, The. 11-Deoxy-11α-alkyl-PGE compounds from PGA compounds by lithium alkylation. 4,477,684, Cl. 568-379.000.

Bunger, Richard E. Cooling system for cattle confinement pens. 4,476,809, Cl. 119-16.000.

Bunn-O-Matic Corporation: *See*—
Daugherty, Donald L., 4,476,775, Cl. 99-295.000.

Burba, John L., III, to Dow Chemical Company, The. Crystalline 2-layer lithium-hydroxy aluminates. 4,477,367, Cl. 252-184.000.

Burba, John L., III: *See*—
Lee, John M.; Bauman, William C.; Wolcott, Richard A.; and Burba, John L., III, 4,477,597, Cl. 521-28.000.

Burch, Donald J.: *See*—
Taenzer, Jon C.; Burch, Donald J.; and Green, Philip S., 4,476,874, Cl. 128-663.000.

Burgin, Ralph C.; and Cale, David B., to Dadant & Sons Inc. Ventilated hat. 4,476,589, Cl. 2-184.500.

Burkam, John E., to Boeing Company, The. Elastomeric universal rotor hub. 4,477,225, Cl. 416-134.00A.

Burke Industries, Inc.: *See*—
Gerber, Dennis H., 4,476,992, Cl. 220-219.000.

Burkle, Erwin: *See*—
Eichlseder, Martin; and Burkle, Erwin, 4,477,242, Cl. 425-207.000.

Burns, Henry L.; and Peterson, Erik W., to Bear Medical Systems, Inc. Gas flow measurement with detented chopper valve. 4,476,707, Cl. 73-4.00R.

Burroughs Corporation: *See*—
Rudd, Robert E., III, 4,477,869, Cl. 346-140.00R.

Burstell, Helmut: *See*—
Willms, Lothar; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,477,276, Cl. 71-94.000.

Burton, Richard J.: *See*—
Allan, Jonathan M.; Burton, Richard J.; and Jurock, Volker, 4,477,342, Cl. 210-87.000.

Bush, Robert E., to Gray Tool Company. Fire resistant connections and dovetail-like sealing means therefor. 4,477,092, Cl. 277-211.000.

Bushnell, Donald D. Portable barbell and dumbbell rack. 4,477,074, Cl. 272-123.000.

Bustamante, Louis A., to International Business Machines Corporation. Photoconductor advance system for copiers and the like. 4,477,180, Cl. 355-14.00R.

Butler, Theodore G.: *See*—
Brashears, David F.; Elliott, Emanuel J.; and Butler, Theodore G., 4,477,250, Cl. 432-3.000.

Byrd, Thomas M., Jr.; and Aboujaoude, Khalil F., to Westinghouse Electric Corp. Watthour meter with tamper resistant seal. 4,477,861, Cl. 361-371.000.

Byrne, David S., to Warner-Lambert Company. Razor with sliding blade cover. 4,476,630, Cl. 30-47.000.

Byrne, Paul, to Analog Data Systems. Density sensor. 4,476,723, Cl. 73-453.000.

C. Van der Lely N.V.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,476,666, Cl. 56-13.600.

Cacarda, Jaroslav, to E. Cacarda GmbH. Process for the production of a solar collector panel assembly and a panel assembly produced thereby. 4,476,856, Cl. 126-447.000.

Cain, Charles J.: *See*—
Wason, Thomas D.; and Cain, Charles J., 4,477,860, Cl. 361-306.000.

Cain Encoder Company: *See*—
Wason, Thomas D.; and Cain, Charles J., 4,477,860, Cl. 361-306.000.

Calabro, Max; Girard, Herve ; and Le Corre, Alain, to Societe Nationale Industrielle Aerospatiale. Hot nozzle. 4,477,025, Cl. 239-265.350.

Cale, David B.: *See*—
Burgin, Ralph C.; and Cale, David B., 4,476,589, Cl. 2-184.500.

California Microwave, Inc.: *See*—
Collins, Edward, IV, 4,477,811, Cl. 343-17.700.

Callis, Howard F. Adjustable rake head and improved handle support. 4,477,114, Cl. 294-50.600.

Cambridge Aero Instruments, Inc.: *See*—
Ismail, Raouf A.; and Mead, Jonathan T., 4,476,720, Cl. 73-202.000.

Camco, Incorporated: *See*—
Winders, Carl E.; and Watkins, Fred E., 4,476,924, Cl. 166-84.000.

Cameron, Harold A.: *See*—
Sutter, Leroy V., Jr.; and Cameron, Harold A., 4,477,087, Cl. 277-26.000.

Camillo Corvi S.p.A.: *See*—
Mora, Camillo C., 4,477,458, Cl. 424-266.000.

Campbell, Andrew B.: *See*—
Boyadjieff, George I.; and Campbell, Andrew B., 4,476,936, Cl. 166-383.000.

Campbell, Richard W., to General Electric Company. Photocurable polyfunctional acrylic coating and decorative articles coated therewith. 4,477,529, Cl. 428-412.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Smith, Norman L., 4,477,110, Cl. 292-1.000.
Canadian Patents & Development Limited: *See*—
Schneider, Henry; Maleszka, Ryszard; Wang, Patrick Y.; Veliky, Ivan A.; and Chan, Yui-Kwok, 4,477,569, Cl. 435-161.000.
So, Eddy, 4,477,772, Cl. 324-59.000.
Cannon, Joseph N.; De Lucia, David E.; Jackson, William M.; and Porter, James H. Staged cascade fluidized bed combustor. 4,476,816, Cl. 122-4.00D.
Canon Kabushiki Kaisha: *See*—
Furuichi, Katsushi; Yokomizo, Yoshikazu; Honma, Toshio; and Murakami, Katsumi, 4,477,178, Cl. 355-14.00R.
Hosoe, Kazuya, 4,477,168, Cl. 354-403.000.
Inuzuka, Tsuneki; Ishida, Masato; and Kawatsura, Yoshihiro, 4,477,179, Cl. 355-14.00E.
Matsufuji, Yohji; Togano, Shigeo; and Ichihashi, Hiroo, 4,477,823, Cl. 346-140.00R.
Sato, Yasuhisa, 4,477,154, Cl. 350-432.000.
Sato, Yasuhisa; Yokota, Hideo; and Yamada, Yasuyuki, 4,477,155, Cl. 350-469.000.
Suda, Shigeyuki; and Ikemori, Keiji, 4,477,153, Cl. 350-426.000.
Tsuji, Sadahiko; and Tajima, Akira, 4,477,148, Cl. 350-286.000.
Yamada, Masanori; and Katsuma, Makoto, 4,477,170, Cl. 354-415.000.
Yamada, Masanori, 4,477,171, Cl. 354-416.000.
Yokota, Hideo, 4,477,172, Cl. 354-480.000.
Cantwell, Gill. Positioning apparatus. 4,476,735, Cl. 74-84.00R.
Capetrol International, Inc.: *See*—
Garcia, Silverio M., 4,477,364, Cl. 252-142.000.
Caputi, Jean-Louis: *See*—
de Sivry, Bruno; Herve, Guy; Colas, Claude; and Caputi, Jean-Louis, 4,476,605, Cl. 15-179.000.
Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co.: *See*—
Spensberger, Johann, 4,477,214, Cl. 409-34.000.
Carlson, Gerald L.; and Snider, Warren E., to Westinghouse Electric Corp. Sampling high purity water for trace ion determination. 4,476,712, Cl. 73-61.10C.
Carlson, Henning L., to Bifok AB. Photometric cuvette. 4,477,186, Cl. 356-246.000.
Carome, Edward F.; and Davis, Charles M., to Optical Technologies, Inc., a part interest. Fiber optic electric field sensor/phase modulator. 4,477,723, Cl. 250-227.000.
Caron, Bernard G.: *See*—
Bowen, Terry P.; Caron, Bernard G.; Glover, Douglas W.; and Hoffer, John C., 4,477,146, Cl. 350-96.210.
Carr, Dennis D.: *See*—
Miller, Lee E.; and Carr, Dennis D., 4,477,540, Cl. 429-27.000.
Carreno, Diether E., to General Electric Company. Balance for rotating member. 4,477,226, Cl. 416-144.000.
Carrier Corporation: *See*—
Drucker, Alan S.; D'Aversa, Richard D.; and Jeffers, Richard D., 4,476,920, Cl. 165-29.000.
Kropiwnicki, Tadek M.; and Cross, Linda E., 4,477,229, Cl. 417-53.000.
Pickering, Mark A., 4,476,850, Cl. 126-112.000.
Carrigan, David G.: *See*—
Li, Hsin L.; Misson, John D.; and Carrigan, David G., 4,476,753, Cl. 83-36.000.
Carroll, James W.; and Comstock, James E., to Pennwalt Corporation. Cleaning and etching process for aluminum containers. 4,477,290, Cl. 148-6.000.
Carson, Don B., to UOP Inc. Utility conservation in hydrogen recycle processes. 4,477,413, Cl. 422-62.000.
Carter, Jerry A. Articulated powered lift machines. 4,476,955, Cl. 182-2.000.
Carville, Kenneth D. Adjustable arrow support. 4,476,846, Cl. 124-41.00A.
Case, William E., to LTV Aerospace and Defense Company. Method and apparatus for population inversion. 4,477,906, Cl. 372-41.000.
Casio Computer Co., Ltd.: *See*—
Ishii, Hiroshi, 4,476,766, Cl. 84-1.030.
Cason, William C.: *See*—
Advani, Hira; Cason, William C.; and Hayes, Gerald E., 4,477,880, Cl. 364-900.000.
Casper, Paul W.; Toy, James W.; Orlando, Fred J., Jr.; and Giri, Ronald R., to Harris Corporation. Synchronized protection switching arrangement. 4,477,895, Cl. 370-16.000.
Cassatta, Joseph C.; Garrett, David L., Jr.; and van Oene, Henk, to Ford Motor Company. Discoloration resistant, flexible, radiation curable coating compositions. 4,477,327, Cl. 204-159.150.
Castelbaum, Leonard; Ostrowski, Joseph M.; and Bedson, Joseph H., Jr., to Goodall Rubber Company. Flexible hose having an end connection fitting. 4,477,108, Cl. 285-149.000.
Castonguay, Roger N.; and Jencks, Charles L., to General Electric Company. Secondary disconnect plugs for programmable circuit breakers. 4,477,701, Cl. 200-50.0AA.
Catalano, Anthony W.: *See*—
Barnett, Allen M.; Catalano, Anthony W.; Dalal, Vikram L.; Masi, James V.; Meakin, John D.; and Hall, Robert B., 4,477,688, Cl. 136-258.000.
Caton, Mary T.: *See*—
Balash, Frederick A.; and Caton, Mary T., 4,477,700, Cl. 200-5.00A.
Cearlock, Steven V.; Peterson, Francis C.; and Kunos, Gene S., to Illinois Tool Works Inc. Friction welded fastener system. 4,477,307, Cl. 156-580.000.
Cegielski, John M., Jr., to John Zink Company. Hazardous waste steam generator. 4,476,791, Cl. 110-346.000.
Cellone, Luigi; and Loiacono, Marco, to Minnesota Mining and Manufacturing Company. Photographic silver halide emulsions, process for preparing the same and their use in color reversal films. 4,477,564, Cl. 430-567.000.
Central Glass Co., Ltd.: *See*—
Watanabe, Nobuatsu; Nakajima, Tsuyoshi; and Kawaguchi, Masayuki, 4,477,374, Cl. 252-508.000.
Centre Technique de L'Industrie des Papiers, Cartons et Cellulose: *See*—
Perrin, Bernard; Bianchin, Bernard; and Sauret, Georges, 4,477,359, Cl. 210-785.000.
Cesar, Jean P.; Gouttebessis, Jacques; and Schneider, Andre, to Compagnie Generale des Etablissements Michelin. Reinforcement for tires produced by molding. 4,476,908, Cl. 152-357.00A.
Ceshkovsky, Ludwig: *See*—
Mooney, Donald G.; and Ceshkovsky, Ludwig, 4,477,890, Cl. 369-53.000.
Cetus Corporation: *See*—
Chang, Shing; and Meade, James H., 4,477,571, Cl. 435-253.000.
Champion International Corporation: *See*—
Bird, Perry L., 4,476,761, Cl. 83-614.000.
Webinger, George P., 4,477,017, Cl. 229-39.00R.
Chan, Albert S., to Monsanto Company. Hydroformylation process to prepare glycolaldehydes. 4,477,685, Cl. 568-462.000.
Chan, Yui-Kwok: *See*—
Schneider, Henry; Maleszka, Ryszard; Wang, Patrick Y.; Veliky, Ivan A.; and Chan, Yui-Kwok, 4,477,569, Cl. 435-161.000.
Chang, Glenn E. C.: *See*—
Jones, Robert J.; and Chang, Glenn E. C., 4,477,648, Cl. 528-185.000.
Chang, Shing; and Meade, James H., to Cetus Corporation. Chimeric plasmids that replicate in bacteria and yeast and microorganisms transformed therewith. 4,477,571, Cl. 435-253.000.
Chang, Tai-Hon P.; and Wilson, Alan D., to International Business Machines Corporation. Continuously writing electron beam stitched pattern exposure system. 4,477,729, Cl. 250-492.200.
Chang, Wei K.: *See*—
Gold, Elijah H.; and Chang, Wei K., 4,477,378, Cl. 260-239.0BB.
Chang, Wen-Hsuan: *See*—
Singer, Debra L.; McCollum, Gregory J.; Dowbenko, Rostyslaw; Christenson, Roger M.; Chau, Michael M.; and Chang, Wen-Hsuan, 4,477,618, Cl. 524-157.000.
Chappell, Terry I.; Pohl, Dieter W.; and Woodall, Jerry M., to International Business Machines Corporation. Electro-optic signal conversion. 4,477,721, Cl. 250-211.000.
Charney, Andrew R.; Kercher, Paul W.; and America, William, to Scientific Systems, Inc. Injection valve for liquid chromatographic column and system therefor. 4,476,731, Cl. 73-863.730.
Charvet, Jean-Louis: *See*—
Bouju, Maurice; and Charvet, Jean-Louis, 4,477,301, Cl. 156-136.000.
Chase, Irving C.: *See*—
Baker, Kenneth J.; Buck, Keith E.; Chase, Irving C.; Fraser, Robert B.; and Miles, Clive, 4,476,708, Cl. 73-23.000.
Chau, Michael M.: *See*—
Singer, Debra L.; McCollum, Gregory J.; Dowbenko, Rostyslaw; Christenson, Roger M.; Chau, Michael M.; and Chang, Wen-Hsuan, 4,477,618, Cl. 524-157.000.
Chem Systems, Inc.: *See*—
Greene, Marvin I.; and Gelbein, Abraham P., 4,477,594, Cl. 518-700.000.
Chemplex Company: *See*—
Schmukler, Seymour; Machonis, John, Jr.; and Shida, Mitsuzo, 4,477,532, Cl. 428-441.000.
Chen, George C.; and Rowell, Roger M., to United States of America, Agriculture. Polyhalogenated phenyl isocyanate synthesis with excess phosgene and either triethylamine or tetramethylurea. 4,477,389, Cl. 260-453.0PH.
Chen, Sow-Mei L.: *See*—
Floyd, Middleton B., Jr.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,477,388, Cl. 260-429.700.
Chen, Thomas Y.; and Gibson, Walter G., to RCA Corporation. Video player with caption generator having character background provisions. 4,477,841, Cl. 358-335.000.
Cherkofsky, Saul C., to Du Pont de Nemours, E. I., and Company. Antiinflammatory and/or analgesic 1-alkyl-4,5-diaryl-2-fluoroalkyl-1H-pyrroles. 4,477,463, Cl. 424-274.000.
Chesnokov, Jury M.: *See*—
Ziman, Yan L.; Kottsov, Vladimir A.; Chesnokov, Jury M.; Dunaev, Boris S.; Drokhanov, Alexei N.; Kraush, Klavdia A.; and Barabanov, Stanislav D., 4,477,829, Cl. 358-1.000.
Chevron Research Company: *See*—
Aoyagi, Edward I., 4,477,459, Cl. 424-269.000.
Aoyagi, Edward I., 4,477,462, Cl. 424-273.00P.
Foller, Peter C., 4,477,322, Cl. 204-103.000.
Hutchison, S. O., 4,477,106, Cl. 285-47.000.
Rynbrandt, Jay D., 4,476,947, Cl. 180-2.100.

Chi, Minn-Shong, to Hercules Incorporated. Manufacture of gel free nitrocellulose lacquers. 4,477,297, Cl. 149-109.600.

Chicago Pneumatic Tool Company: *See*—
Wallace, William K.; and Giardino, David A., 4,477,096, Cl. 279-97.000.

Chin, Albert K., to Fogarty, Thomas J. Combined large and small bore syringe. 4,476,866, Cl. 128-344.000.

Chin, Arthur H. T.: *See*—
Wittman, Robert H.; Adkins, David E.; and Chin, Arthur H. T., 4,477,105, Cl. 285-18.000.

Chisso Corporation: *See*—
Sugihara, Taizo; Furukawa, Yasuhiko; and Tomioka, Susumu, 4,477,516, Cl. 428-296.000.
Sugimori, Shigeru; and Kojima, Tetsuhiko, 4,477,369, Cl. 252-299.600.

Chiyoda Chemical Engineering & Construction Co., Ltd.: *See*—
Gomi, Shimpei; Takeuchi, Tomomitsu; Matsuo, Itaru; Fujii, Masaki; Takatsuka, Toru; and Watari, Ryuzo, 4,477,334, Cl. 208-75.000.

Chlosta, Wolfgang; and Pospisil, Peter, to Bodenseewerk Perkin-Elmer & Co., GmbH. Sample for feeding samples in gas chromatography. 4,476,733, Cl. 73-863.910.

Cho, Ching F., to International Telephone & Telegraph Corporation. Corrugated antenna feed horn with means for radiation pattern control. 4,477,816, Cl. 343-786.000.

Choate, Bruce R., to Sargent Industries, Inc. Bearing. 4,477,197, Cl. 384-296.000.

Cholat-Namy, Jean, to International Business Machines Corporation. Process for determining active channel configurations in a multiplex communications system and a system for implementing said process. 4,477,898, Cl. 370-80.000.

Chore-Time Equipment, Inc.: *See*—
Swartzendruber, Ray E., 4,476,811, Cl. 119-52.0AF.

Chorel, Jacques; Migeon, Andre ; and Torregrosa, Michel, to Crouzet. Differential pressure gauge. 4,476,725, Cl. 73-704.000.

Chou, Mau-Song: *See*—
Zawadzkas, Gerald A.; and Chou, Mau-Song, 4,477,710, Cl. 219-117.100.

Christensen, James J.: *See*—
Izatt, Reed M.; Christensen, James J.; and Hawkins, Richard T., 4,477,377, Cl. 252-631.000.

Christenson, Roger M.: *See*—
Singer, Debra L.; McCollum, Gregory J.; Dowbenko, Rostyslaw; Christenson, Roger M.; Chau, Michael M.; and Chang, Wen-Hsuan, 4,477,618, Cl. 524-157.000.

Christian, Earl L.: *See*—
Eng, Berwyn S.; and Christian, Earl L., 4,476,654, Cl. 51-26.000.

Chu, Simon L.; Golda, Eugene; Huang, Jen-Chi; and Wilkes, Alan, to Polychrome Corporation. Aluminum substrates useful for lithographic printing plates. 4,477,317, Cl. 204-33.000.

Chudy, Elzbeita; Gamson, Nicolette; and Kellner, Phillip R., to Crosfield Electronics Limited. Correction of gravure printing members. 4,477,309, Cl. 156-635.000.

Chung, Kah-Seng, to U.S. Philips Corporation. Transmitter for angle-modulated signals. 4,477,916, Cl. 375-60.000.

Chupik, John M.: *See*—
Speer, Wayne; and Chupik, John M., 4,476,653, Cl. 49-468.000.

Churyo Engineering Co., Ltd.: *See*—
Akimoto, Ryosaku; Yoshida, Yukio; and Ito, Nobuaki, 4,476,919, Cl. 165-28.000.

Ciba-Geigy Corporation: *See*—
Babler, Fridolin; and Weissmuller, Adolf, 4,477,608, Cl. 523-215.000.
Deiner, Hans; Mosch, Franz; Sandner, Bernhard; and Bernheim, Willy, 4,477,498, Cl. 427-389.900.
Dexter, Martin; and Winter, Roland A. E., 4,477,614, Cl. 524-91.000.
Kaschig, Jurgen, 4,477,673, Cl. 546-344.000.
Reid, William J., 4,477,638, Cl. 526-84.000.
Scartazzini, Riccardo; and Bickel, Hans, 4,477,658, Cl. 544-16.000.
Slade, Joel; and Stanton, James L., 4,477,464, Cl. 424-275.000.
Vlattas, Isidoros, 4,477,379, Cl. 260-243.300.

Ciciora, John A.: *See*—
Johnson, Dale R.; and Ciciora, John A., 4,476,954, Cl. 180-333.000.

Ciganek, Engelbert, to Du Pont de Nemours, E. I., and Company. Octahydro-4A,7-ethano- and -etheno-benzofuro[3,2-e]isoquinoline derivatives having analgesic, narcotic antagonist and anorexigenic properties. 4,477,456, Cl. 424-258.000.

Cirigliano, Michael C.: *See*—
Tiberio, Jeanne E.; and Cirigliano, Michael C., 4,477,478, Cl. 426-330.600.

Citizen Watch Company Limited: *See*—
Nakagiri, Tadahiko, 4,477,797, Cl. 340-365.00S.
Saitoh, Mitsuo; Kamiyama, Yasuo; and Murata, Mitsuhiro, 4,477,195, Cl. 368-88.000.

Ciupke, Werner W.: *See*—
Danby, Hal C.; and Ciupke, Werner W., 4,477,054, Cl. 251-122.000.

Clarion Co., Ltd.: *See*—
Kume, Masato, 4,477,127, Cl. 312-8.000.

Clark, David A.; Strong, David C.; and White, Thomas Q., II, to R. R. Donnelley & Sons Company. Method of color conversion with improved interpolation. 4,477,833, Cl. 358-80.000.

Clarke, Robert L., to United States of America, Navy. Platinum underlayers and overlayers for coatings. 4,477,538, Cl. 428-656.000.

Claypool, Ralph J.: *See*—
Laughlin, Sidney J.; and Claypool, Ralph J., 4,477,269, Cl. 55-290.000.

Cleveland, Dixon; Havens, James R.; Nagel, Gregory L.; Decina, Basil A., Jr.; and Jenuwine, William C., to General Motors Corporation. Method and apparatus for detecting edge welds during resistance spot welding. 4,477,709, Cl. 219-109.000.

Cline, Harvey E., to General Electric Company. Making metal eutectic fine wire arrays. 4,477,324, Cl. 204-129.100.

Close, Ernest F., to Magnavox Consumer Electronics Company. AM Stereo detector. 4,477,924, Cl. 381-15.000.

Clurman, Stanley P., to RCA Corporation. Protective cartridge for disc record. 4,477,894, Cl. 369-270.000.

Clyma, Malcolm R., to Spring Gully Pickles Pty, Limited. Onion peeling. 4,476,778, Cl. 99-516.000.

Coal Industry (Patents) Limited: *See*—
Williams, David R., 4,476,943, Cl. 175-61.000.

Cobaugh, Robert F.: *See*—
Andrews, Howard W., Jr.; Billman, Timothy B.; and Cobaugh, Robert F., 4,477,138, Cl. 339-65.000.

Cobb, Sanford, Jr.: *See*—
Fanselow, Dan L.; Cobb, Sanford, Jr.; and Bergsten, Ronald E., 4,476,593, Cl. 5-417.000.

Coburn, Robert E., to Molins Machine Company, Inc. Automatic slitter scorer with web support. 4,476,758, Cl. 83-479.000.

Cogan, Adrian I., to GTE Laboratories Inc. Recessed gate static induction transistor fabrication. 4,476,622, Cl. 29-571.000.

Colaruotolo, Joseph F.; Olsen, Ronald H.; and Vandenbergh, Peter A., to Occidental Chemical Corporation. Microbial degradation of obnoxious organic wastes into innocuous materials. 4,477,570, Cl. 435-253.000.

Colas, Claude: *See*—
de Sivry, Bruno; Herve, Guy; Colas, Claude; and Caputi, Jean-Louis, 4,476,605, Cl. 15-179.000.

Collinet, Jean C.; and Slyke, Mark V., to M/A Com, Inc. Dielectric resonator tuner and mechanical mounting system. 4,477,788, Cl. 333-235.000.

Collins, David W.; Neesz, John J.; and Stich, Michael C., to International Business Machines Corporation. Multi-level disk drive motor speed control. 4,477,750, Cl. 318-270.000.

Collins, Edward, IV, to California Microwave, Inc. Automatic MDS level analyzer. 4,477,811, Cl. 343-17.700.

Collins, James F. Amino acid isomers, their production and their medicinal use. 4,477,391, Cl. 260-502.50G.

Collins, Robert F.; and Paul, Amy S., to Kendall Company, The. Surgical drape. 4,476,860, Cl. 128-132.00D.

Collins, Stephen H.: *See*—
Holmes, Paul A.; Collins, Stephen H.; and Wright, Leonard F., 4,477,654, Cl. 528-361.000.

Combustion Engineering, Inc.: *See*—
Borio, Richard W.; and Goodstine, Stephen L., 4,476,790, Cl. 110-245.000.

Comer, Matthew R., to United States of America, Air Force. Reduction of signal modulation caused by polarization in visible optical scanning systems. 4,477,152, Cl. 350-394.000.

Commissariat a l'Energie Atomique: *See*—
Fecan, Jean C.; and Morin, Jean, 4,477,415, Cl. 422-164.000.

Communications Satellite Corporation: *See*—
Atia, Ali E., 4,477,785, Cl. 333-202.000.

Compagnie Francaise des Petroles: *See*—
de Sivry, Bruno; Herve, Guy; Colas, Claude; and Caputi, Jean-Louis, 4,476,605, Cl. 15-179.000.

Compagnie Generale des Etablissements Michelin: *See*—
Bouju, Maurice; and Charvet, Jean-Louis, 4,477,301, Cl. 156-136.000.
Jamon, Jacques, 4,477,120, Cl. 301-6.00W.

Compagnie Generale des Etablissements Michelin: *See*—
Cesar, Jean P.; Gouttebessis, Jacques; and Schneider, Andre, 4,476,908, Cl. 152-357.00A.

Comstock, James E.: *See*—
Carroll, James W.; and Comstock, James E., 4,477,290, Cl. 148-6.000.

Conklin, Michael T.; and Mowry, Charles F., to Fire Out Enterprises Company, Inc. Cooling heated metal surfaces. 4,476,687, Cl. 62-64.000.

Connaught Laboratories Limited: *See*—
Healy, George M.; Sun, Anthony M.; and Macmorine, Hilda G., 4,477,567, Cl. 435-71.000.

Conoco Inc.: *See*—
Yoon, Heeyoung, 4,476,818, Cl. 123-3.000.

Conrad, Richard J., to Hewlett-Packard Company. Stripchart recorder intensity enhancement. 4,477,803, Cl. 340-722.000.

Conrads, Hans; Hoffmans, Josef; Hippel, Hans; Hoven, Hubert; Rolaussf, Hans; and Schafer, Max, to Maschinenfabrik Karl Zangs AG. Embroidery machine. 4,476,793, Cl. 112-221.000.

Consolidated Olympic Corporation: *See*—
Backus, George S., 4,476,798, Cl. 114-77.00R.

Constantine, Anthony. Method of and apparatus for the production of charcoal. 4,476,789, Cl. 1.10-229.000.

Container Corporation of America: *See*—
Brandenburger, Allen M., 4,477,014, Cl. 229-22.000.
Lozaun, Gary D., 4,477,015, Cl. 229-23.00R.

Control Data Corporation: *See*—
Mittelsteadt, Robert A., 4,477,706, Cl. 219-0.55B.

Conway, Gerald A. Pad holder and display. 4,477,048, Cl. 248-447.100.

Conway, Tim D.: *See*—
Paddock, Paul F.; Krage, William G.; and Conway, Tim D., 4,476,982, Cl. 209-582.000.

Cook, George E.; and Wells, A. Michael, to CRC Welding Systems, Inc. Sidewall-matching adaptive control system for welding. 4,477,713, Cl. 219-124.340.

Cook, John. Tool for removing and reapplying rivets. 4,476,615, Cl. 29-243.540.

Cooksey, James J.: *See*—
Stables, Wilbur L.; Cooksey, James J.; and Newell, Harry L., Jr., 4,476,729, Cl. 73-861.610.

Cooper, Glenn D., deceased: *See*—
Haaf, William R.; Lee, Gim F., Jr.; and Cooper, Glenn D., deceased, 4,477,627, Cl. 525-67.000.

Cooper Industries, Inc.: *See*—
Krabec, James A.; Kincaid, John W.; and Miller, Paul B., 4,477,693, Cl. 174-36.000.

Cooper, Ralph M.; and Pegram, Warren J., to AMP Incorporated. Fastener. 4,477,142, Cl. 339-125.00R.

Cooper, Rose H., executrix: *See*—
Haaf, William R.; Lee, Gim F., Jr.; and Cooper, Glenn D., deceased, 4,477,627, Cl. 525-67.000.

Cope, Stephen N., to Solartron Electronic Group Limited. Discrete Fourier transform with non-tumbled output. 4,477,878, Cl. 364-726.000.

Corbett, David F.; Brown nee Davis, Pamela; and Ponsford, Roger J., to Beecham Group p.l.c. 2-Substituted thio carbapenem derivatives. 4,477,662, Cl. 544-212.000.

Corbett Elevator Manufacturing Co., Inc.: *See*—
Gorman, Gerald W.; and Herrmann, Walter J., 4,476,772, Cl. 92-168.000.

Corning Glass Works: *See*—
Johnson, Ronald E.; and Wu, Lung-ming, 4,477,510, Cl. 428-200.000.

Corwin, H. Russell, to Deere & Company. Rotor bearing lubricating system. 4,477,240, Cl. 418-94.000.

Cosar, Paul; and Henin, Jean-Pierre, to Fives-Cail Babcock. Process and apparatus for calcining pulverulent material. 4,477,251, Cl. 432-106.000.

Cosmo, Nicola, to AMP Incorporated. Miniature cam driven connector for a circuit board edge. 4,477,133, Cl. 339-17.00M.

Costerousse, Germain: *See*—
Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, 4,477,445, Cl. 424-239.000.

Cottrell, Peter E.; Gersbach, John E.; and Pricer, Wilbur D., to International Business Machines Corporation. Sensitive amplifier having a high voltage switch. 4,477,846, Cl. 360-46.000.

Cotzas, George M., to General Electric Company. Static excitation system. 4,477,767, Cl. 322-59.000.

Courtois, Yves; Barritault, Denis; and Pouliquen, Yves, to Institut National de la Sante et de la Recherche Medicale (INSERM). Method for regenerating corneal epithelium. 4,477,435, Cl. 424-95.000.

Coutts, Stephen M.: *See*—
Jones, Howard; and Coutts, Stephen M., 4,477,446, Cl. 424-244.000.

Cowab AB: *See*—
Dahlborg, Christer, 4,476,699, Cl. 70-34.000.

Cox, Herman P.: *See*—
Hurn, Richard L.; Harris, Gregory C.; and Cox, Herman P., 4,476,602, Cl. 15-28.000.

Cox, Pope D. Sand shield for bottom hole pumps. 4,476,925, Cl. 166-105.100.

CPC International Inc.: *See*—
Petrocine, David V.; and Swidinsky, John A., 4,477,679, Cl. 549-486.000.

Crain, Norman R.; and Hardison, Robert P., to Radiant Technology Corporation. Infrared furnace with controlled environment. 4,477,718, Cl. 219-388.000.

Crawford, William B.; and Barber, Brian D., to Newman Machine Company, Inc. Yielding pressure bar for wood planing machines. 4,476,906, Cl. 144-116.000.

CRC Welding Systems, Inc.: *See*—
Cook, George E.; and Wells, A. Michael, 4,477,713, Cl. 219-124.340.

Cremona, Sauveur; and Pijselman, Joel. Coated papers and cardboards and process for their manufacture. 4,477,518, Cl. 428-327.000.

Crespy, Serge. Resettable mirror assembly. 4,477,149, Cl. 350-288.000.

Crist, Stephen D.: *See*—
Plank, Vernon G.; Crist, Stephen D.; and LaGross, Dennis L., 4,476,718, Cl. 73-171.000.

Crocker, Angus M., to GTE Network Systems Corporation. Printed circuit fuse. 4,477,857, Cl. 361-119.000.

Crook, Stephen E.: *See*—
Rocci, Joseph D.; and Crook, Stephen E., 4,477,799, Cl. 340-533.000.

Crooks, James W. Multi-speed fan drive apparatus. 4,476,744, Cl. 74-751.000.

Crooks, Sidney R. Pet waste pickup device. 4,477,111, Cl. 294-1.0BA.

Crosby, Walter R. Board game with number selection device. 4,477,081, Cl. 273-251.000.

Crosfield Electronics Limited: *See*—
Chudy, Elzbeita; Gamson, Nicolette; and Kellner, Phillip R., 4,477,309, Cl. 156-635.000.

Cross, Linda E.: *See*—
Kropiwnicki, Tadek M.; and Cross, Linda E., 4,477,229, Cl. 417-53.000.

Crounse, Nathan N.; and Schmidt, Paul J., to Hilton-Davis Chemical Co., The. 4-(3-Indolyl)-2,3-dichloro-4-oxo-2-butenoic acids. 4,477,676, Cl. 548-493.000.

Crouzet: *See*—
Chorel, Jacques; Migeon, Andre ; and Torregrosa, Michel, 4,476,725, Cl. 73-704.000.

Crowe, Gerald E.: *See*—
O'Driscoll, Peter F.; Crowe, Gerald E.; and Berry, John, 4,477,024, Cl. 239-265.110.

Crudgington, Cleveland B., Jr. Electronic amusement center. 4,477,069, Cl. 272-3.000.

Crull, Stanley W.: *See*—
Pollman, Frederic W.; and Crull, Stanley W., 4,476,680, Cl. 60-444.000.

Cuckson, John: *See*—
Poldervaart, Leendert; and Cuckson, John, 4,476,802, Cl. 114-296.000.

Cue, Berkeley W.; and Massett, Stephen S., to Pfizer Inc. 3-Acetoxy or benzyloxy-2-acetoxymethyl-6-[1-acetoxy-2-(N-tert-butylacetamido)ethyl]pyridine intermediates. 4,477,671, Cl. 546-291.000.

Cummins, William T.: *See*—
Leblanc, Raymond F.; and Cummins, William T., 4,477,302, Cl. 156-165.000.

Curtis, R. Stephen. Shoe-foot interface. 4,476,858, Cl. 128-80.00R.

Cutter Laboratories, Inc.: *See*—
Hardie, W. Richard, 4,477,432, Cl. 424-85.000.

Cutters Exchange, Inc.: *See*—
Smith, Hoyt L.; and Farrar, D. Frank, Jr., 4,477,065, Cl. 270-31.000.

Czichy, Eleonore, to Interletter AG. Composite foil from which layer areas having metallic luster are transferred onto a base. 4,477,312, Cl. 156-656.000.

Dadant & Sons Inc.: *See*—
Burgin, Ralph C.; and Cale, David B., 4,476,589, Cl. 2-184.500.

Dahlborg, Christer, to Cowab AB. Locking device, especially intended to prevent stealing of boats provided with outboard motors. 4,476,699, Cl. 70-34.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Matsumoto, Katsutoshi, 4,476,782, Cl. 101-450.100.
Oka, Masahiko, 4,476,601, Cl. 15-21.00D.

Daisuke, Koga: *See*—
Tamura, Masahide; and Daisuke, Koga, 4,477,786, Cl. 333-207.000.

Dalal, Vikram L.: *See*—
Barnett, Allen M.; Catalano, Anthony W.; Dalal, Vikram L.; Masi, James V.; Meakin, John D.; and Hall, Robert B., 4,477,688, Cl. 136-258.000.

D'Alelio, Gaetano F., deceased (by St. Joseph Bank & Trust Co., Executor), to Monacelli, Walter J., a part interest. Treatment of irritated and excoriated areas around the stoma of ostomy patients. 4,477,439, Cl. 424-162.000.

D'Altilia, Gianluigi; and Rinaldi, Francesco, to Samim Societa Azionaria Minero-Metallurgica SpA. Process for producing high-purity metals. 4,477,277, Cl. 75-0.50B.

Dalziel, Warren L.; Flanigan, Charles D.; and Lynott, John J., to Microtek Storage Corporation. Magnetic data storage and drive apparatus. 4,477,851, Cl. 360-95.000.

Dana Corporation: *See*—
Brown, Henry M., Jr.; and Fredette, Andrew J., 4,476,965, Cl. 188-171.000.

Danby, Hal C.; and Ciupke, Werner W., to Anatros Corporation. Precision valve assembly. 4,477,054, Cl. 251-122.000.

Danesi, Sergio; Forti, Sergio; and Manica, Michele, to Montedison S.p.A. Process for preparing polyolefinic elastomeric compositions by dynamic vulcanizaion. 4,477,631, Cl. 525-133.000.

Danilevich, Yanush B.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Turutin, Veniamin S.; Bezchastnov, Gennady A.; and Telezhnikov, Jury F., 4,477,690, Cl. 174-15.00C.

Danley, Allen M.; and Steingraber, Mark L., to Plastics, Inc. Microwave oven popcorn popper, steamer and roaster. 4,477,705, Cl. 219-10.55E.

Darcy, Kevin A.; and Faithfull, Terence F. H., to Boeing Company, The. Elevator feel actuator. 4,477,044, Cl. 244-223.000.

Das, Balbhadra; and Moore, L. Dow, to PPG Industries, Inc. Process for preparing sized glass fiber roving. 4,477,496, Cl. 427-375.000.

Data General Corporation: *See*—
Pellegrino, John, 4,477,867, Cl. 363-26.000.

Dataproducts Corporation: *See*—
Palombo, Gaston A.; and Do, Dung D., 4,477,757, Cl. 318-696.000.

Daugherty, Donald L., to Bunn-O-Matic Corporation. Coffee making machine. 4,476,775, Cl. 99-295.000.

D'Aversa, Richard D.: *See*—
Drucker, Alan S.; D'Aversa, Richard D.; and Jeffers, Richard D., 4,476,920, Cl. 165-29.000.

Davis, Charles M.: *See*—
Carome, Edward F.; and Davis, Charles M., 4,477,723, Cl. 250-227.000.

Davis, John H. Christmas tree stand. 4,477,049, Cl. 248-524.000.

Davis, Larry: *See*—
Effland, Richard C.; Davis, Larry; and Klein, Joseph T., 4,477,670, Cl. 546-141.000.

Dawson, Robert L., to Du Pont de Nemours, E. I., and Company. Simultaneously chlorinating and grafting a cure site onto polyethylene in an aqueous suspension. 4,477,633, Cl. 525-292.000.

Day, Peter M. G.; Jones, John W.; and Sperry, John A., to Autotype International Limited. Stabilization of diazo-resin sensitizers with polyvinyl pyridine. 4,477,552, Cl. 430-175.000.
Day, Pierce B., to Eastman Kodak Company. Apparatus for projecting a screen pattern onto a photoconductor. 4,477,177, Cl. 355-11.000.
De Biasi, Mark S., to Superior Electric Company, The. Stepping motor overcurrent detection and protection device. 4,477,758, Cl. 318-696.000.
Debru, Michel, to Novatome. Device for cooling the main vessel of a fast fission nuclear reactor. 4,477,410, Cl. 376-404.000.
Debs, Victor: *See*—
Anderle, Joseph A.; and Debs, Victor, 4,476,909, Cl. 160-178.00C.
Decina, Basil A., Jr.: *See*—
Cleveland, Dixon; Havens, James R.; Nagel, Gregory L.; Decina, Basil A., Jr.; and Jenuwine, William C., 4,477,709, Cl. 219-109.000.
DeCloux, Richard J. Bimodal exercise device. 4,477,072, Cl. 272-73.000.
Deere & Company: *See*—
Corwin, H. Russell, 4,477,240, Cl. 418-94.000.
Luchsinger, Patrick M., 4,477,406, Cl. 264-275.000.
Magin, Ludwig B., 4,476,743, Cl. 74-665.0GB.
Reilly, Roger D., 4,476,668, Cl. 56-202.000.
Thompson, James E.; Sandvik, Leonard E.; and Elliott, Marc A., 4,477,050, Cl. 248-636.000.
Degussa Aktiengesellschaft: *See*—
Domesle, Rainer; Volker, Herbert; Koberstein, Edgar; and Pletka, Hans-Dieter, 4,477,417, Cl. 423-213.200.
Deiner, Hans; Mosch, Franz; Sandner, Bernhard; and Bernheim, Willy, to Ciba-Geigy Corporation. Process for the production of perfluoroalkyl residue containing condensation products, the condensation products prepared accordingly, and their use. 4,477,498, Cl. 427-389.900.
Delphian Partners: *See*—
Hadden, David M.; and Micko, Eric S., 4,476,706, Cl. 73-1.00G.
De Lucia, David E.: *See*—
Cannon, Joseph N.; De Lucia, David E.; Jackson, William M.; and Porter, James H., 4,476,816, Cl. 122-4.00D.
Demeter, Elek: *See*—
Apetrei, Constantin; Nitigus, Victor; Demeter, Elek; Radulescu, Marian; and Sachelarie, Toma, 4,477,743, Cl. 310-77.000.
DeNeef, John G.: *See*—
Thiel, Patrick L.; Lawry, Clifford F.; and DeNeef, John G., 4,477,791, Cl. 336-60.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Abe, Masanori; and Tamaura, Yutaka, 4,477,319, Cl. 204-56.00R.
Isogai, Jun; Nakaya, Seiichi; Saitou, Akira; Takahashi, Akio; and Yagi, Isao, 4,477,284, Cl. 106-104.000.
Densmore, Neal W., to Joy Manufacturing Company. Monorail suspended conveyor system. 4,476,975, Cl. 198-864.000.
Dente, Gregory C.: *See*—
Salvi, Theodore C.; Smithers, Martin E.; and Dente, Gregory C., 4,477,909, Cl. 372-95.000.
DePuy, Robert P., to General Electric Company. Relay spare circuit for a recloser relay. 4,477,856, Cl. 361-72.000.
Deraedt, Roger: *See*—
Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, 4,477,445, Cl. 424-239.000.
de Ross, Kris B.: *See*—
van den Bosch, Steven; Kettenes, Dirk K.; de Ross, Kris B.; Sipma, Gerben; and Stoffelsma, Jan, 4,477,678, Cl. 549-62.000.
Descure, Pierrick: *See*—
Berger, Jean L.; and Descure, Pierrick, 4,477,835, Cl. 358-213.000.
de Sivry, Bruno; Herve, Guy; Colas, Claude; and Caputi, Jean-Louis, to Compagnie Francaise des Petroles. Rotary metal brush for removing submerged anti-corrosive covering and method for using the same. 4,476,605, Cl. 15-179.000.
Deutsch, Alice; Brandwein, Harvey; Platt, Herbert; Hunter, Dianne M.; Dubitsky, Andrew; and Durham, Susan M., to Mex Research Associates. Antigen assay method and kit. 4,477,576, Cl. 436-500.000.
Dexter, Martin; and Winter, Roland A. E., to Ciba-Geigy Corporation. 2-[2-Hydroxy-3,5-di-tert-octylphenyl]-2H-benzotriazole stabilized compositions. 4,477,614, Cl. 524-91.000.
Diacont, George P., Jr.; and Grisham, James D., to AMF Inc. Feed-through folder apparatus. 4,476,792, Cl. 112-142.000.
Diaz, Daniel. Container assembly. 4,476,883, Cl. 132-73.000.
Dickinson, David G.: *See*—
Liston, Max D.; Dickinson, David G.; and Stark, William A., 4,477,190, Cl. 356-418.000.
Dickinson, Johanne C.; and Frey, William A., to Du Pont de Nemours, E. I., and Company. Method for the removal of interfering substances in theophylline assays. 4,477,346, Cl. 210-198.200.
Dickson, Dale A.: *See*—
Sorenson, Paul D.; Dickson, Dale A.; McNichols, Larry A.; and Badzinski, John D., 4,476,873, Cl. 128-660.000.
Didier Engineering GmbH: *See*—
Bauer, Hartmut K.; and Otte, Ernst A. W., 4,477,420, Cl. 423-234.000.
Diefenbach, Horst; and Geist, Michael, to BASF Farben & Fasern AG. Heat-hardenable binder mixture. 4,477,530, Cl. 428-413.000.
Diefenbach, Horst: *See*—
Geist, Michael; and Diefenbach, Horst, 4,477,642, Cl. 528-61.000.
Diesel Kiki Co., Ltd.: *See*—
Fujimori, Kyoichi; and Okano, Masami, 4,476,832, Cl. 123-502.000.
DiGiulio, Mario. Device for holding work in machine tool operations. 4,477,064, Cl. 269-231.000.
Dimakos, Christos; and Radtke, Gerhard. Instrument for removal of a bone cement tube in an artificial femur head reimplantation. 4,476,861, Cl. 128-303.00R.
Dimar Holding Corporation: *See*—
Green, William G., deceased, 4,476,928, Cl. 166-267.000.
Dineen, Gertrude D., administratrix: *See*—
Dineen, John J., deceased, 4,476,681, Cl. 60-486.000.
Dineen, John J., deceased (by Dineen, Gertrude D., administratrix), to Mechanical Technology Incorporated. Balance free-piston hydraulic pump. 4,476,681, Cl. 60-486.000.
Discovision Associates: *See*—
Mooney, Donald G.; and Ceshkovsky, Ludwig, 4,477,890, Cl. 369-53.000.
Do, Dung D.: *See*—
Palombo, Gaston A.; and Do, Dung D., 4,477,757, Cl. 318-696.000.
Dobhan, Herbert: *See*—
Leuner, Hilmar; Dobhan, Herbert; Bauer, Bernhard; and Olschewski, Armin, 4,476,913, Cl. 164-346.000.
Dr. H. Tiefenbach GmbH & Co.: *See*—
Lachmann, Helmut; and Lange, Bernd, 4,476,888, Cl. 137-102.000.
Doin, James E.; and Vaughn, Howard A., Jr., to General Electric Company. Thermoformable silicone resin coating composition and dual component coating system for polycarbonate. 4,477,499, Cl. 427-412.100.
Dolc, Reinhard: *See*—
Brandl, Harald; Dolc, Reinhard; and Kammerhofer, Klaus, 4,477,722, Cl. 250-222.100.
Domesle, Rainer; Volker, Herbert; Koberstein, Edgar; and Pletka, Hans-Dieter, to Degussa Aktiengesellschaft. Catalyst for reducing the ignition temperature of diesel soot. 4,477,417, Cl. 423-213.200.
Donnelly, Denis P., to Siena College. Digital diadrometer. 4,477,917, Cl. 377-11.000.
Doorakian, George A.; and Hanafin, Joseph W., to Dow Chemical Company, The. Immobilized epoxy advancement initiators. 4,477,645, Cl. 528-99.000.
Dorflinger, Hans-Dieter: *See*—
Schweiss, Peter; and Dorflinger, Hans-Dieter, 4,477,341, Cl. 209-170.000.
Dorina Nahmaschinen GmbH: *See*—
Holl, Helmar, 4,476,794, Cl. 112-226.000.
Dorr-Oliver Incorporated: *See*—
Kos, Peter, 4,477,393, Cl. 261-76.000.
Dow Chemical Company, The: *See*—
Burba, John L., III, 4,477,367, Cl. 252-184.000.
Doorakian, George A.; and Hanafin, Joseph W., 4,477,645, Cl. 528-99.000.
Fisk, Thomas E., 4,477,603, Cl. 521-137.000.
Gibbs, Marylu B., 4,477,412, Cl. 422-40.000.
Hefner, Robert E., Jr., 4,477,629, Cl. 525-113.000.
Lee, John M.; Bauman, William C.; Wolcott, Richard A.; and Burba, John L., III, 4,477,597, Cl. 521-28.000.
Myers, Jimmy, 4,477,646, Cl. 528-118.000.
Pearce, Roscoe L.; Wolcott, Richard A.; and Pauley, Charles R., 4,477,419, Cl. 423-228.000.
Ramirez, Enrique G., 4,477,591, Cl. 502-340.000.
Schmidt, Donald L.; Klingler, Thomas C.; and Wessling, Ritchie A., 4,477,640, Cl. 526-256.000.
Strange, Carl P.; Messelt, Christopher D.; and Gibson, Clark W., 4,477,657, Cl. 536-91.000.
Sutton, Tonja R.; and Hughes, David W., 4,477,644, Cl. 528-73.000.
Dow Corning Corporation: *See*—
Battice, David R., 4,477,601, Cl. 521-111.000.
Gee, Ronald P.; and Kalinowski, Robert E., 4,477,514, Cl. 428-264.000.
Dowbenko, Rostyslaw: *See*—
Singer, Debra L.; McCollum, Gregory J.; Dowbenko, Rostyslaw; Christenson, Roger M.; Chau, Michael M.; and Chang, Wen-Hsuan, 4,477,618, Cl. 524-157.000.
Dowty Meco Limited: *See*—
Price, Derek T., 4,477,126, Cl. 308-1.00A.
Dragerwerk Aktiengesellschaft: *See*—
Albarda, Scato, 4,477,395, Cl. 261-131.000.
Drees, Paul A.: *See*—
Aluotto, Patrick F.; Drees, Paul A.; and Soucek, Charles A., 4,477,609, Cl. 523-407.000.
Dresser Industries, Inc.: *See*—
Hanshaw, Richard D., 4,476,677, Cl. 60-328.000.
Drew Chemical Corporation: *See*—
Kavchok, Ronald W.; and Boylan, Francis J., 4,477,370, Cl. 252-321.000.
Drexhage, Gerrit K.: *See*—
Reppas, George S.; and Drexhage, Gerrit K., 4,476,592, Cl. 5-164.00B.
Drokhanov, Alexei N.: *See*—
Ziman, Yan L.; Kottsov, Vladimir A.; Chesnokov, Jury M.; Dunaev, Boris S.; Drokhanov, Alexei N.; Kraush, Klavdia A.; and Barabanov, Stanislav D., 4,477,829, Cl. 358-1.000.
Drucker, Alan S.; D'Aversa, Richard D.; and Jeffers, Richard D., to Carrier Corporation. Method and apparatus for integrating operation of a heat pump and a separate heating source. 4,476,920, Cl. 165-29.000.
Drury, Geoffrey. Apparatus and method for transporting growing plants. 4,476,651, Cl. 47-65.000.
Dual Dynamics, Inc.: *See*—
Malec, Jerry P., 4,476,803, Cl. 116-34.00R.

Dube, Maurice T.; Hart, Michael W.; and Hart, Warren H., to H. W. Hart Mfg. Co. Watering cup. 4,476,812, Cl. 119-75.000.
Dubitsky, Andrew: *See*—
Deutsch, Alice; Brandwein, Harvey; Platt, Herbert; Hunter, Dianne M.; Dubitsky, Andrew; and Durham, Susan M., 4,477,576, Cl. 436-500.000.
Duckworth, Charles E. Vapor injection system for internal combustion engine. 4,476,841, Cl. 123-557.000.
Ducret, Lucien C. Automatic cable measuring and cutting machine. 4,476,754, Cl. 83-150.000.
Dueber, Thomas E.; and Nebe, William J., to Du Pont de Nemours, E. I., and Company. Acidic o-nitroaromatics as photoinhibitors of polymerization in positive working films. 4,477,556, Cl. 430-281.000.
Duff-Norton Company, Inc.: *See*—
Ferguson, George R.; and Royer, William W., 4,477,107, Cl. 285-134.000.
Dufft, Jurgen, to Lucas Industries Limited. Method of producing a metal tube and flange assembly. 4,477,010, Cl. 228-138.000.
Duffy, Brian J.; Gratz, Eugene J.; Potter, Steven E.; and Power, Royal A., to Boeing Company, The. Injection molded propeller. 4,477,228, Cl. 416-241.00A.
Duke, Eddie D.: *See*—
Armstrong, Charles M.; and Duke, Eddie D., 4,477,394, Cl. 261-112.000.
Dulac, Robert R. Oil burner shutter. 4,477,248, Cl. 431-153.000.
Dulina, Richard: *See*—
Kazmierczak, Thomas F.; Dulina, Richard; and Petersen, Arthur W., 4,477,288, Cl. 134-19.000.
Dunaev, Boris S.: *See*—
Ziman, Yan L.; Kottsov, Vladimir A.; Chesnokov, Jury M.; Dunaev, Boris S.; Drokhanov, Alexei N.; Kraush, Klavdia A.; and Barabanov, Stanislav D., 4,477,829, Cl. 358-1.000.
Dunham-Bush, Inc.: *See*—
Schaefer, Donald D., 4,477,233, Cl. 417-366.000.
Dunn, David P.: *See*—
Bowlds, Patsy A.; Dunn, David P.; Fathergill, Rex D.; Findlay, Hugh T.; and Stafford, Donald W., 4,477,198, Cl. 400-120.000.
Dunn, Elman R., to Litton Industrial Products, Inc. Adjustable double disc grinder dresser. 4,476,847, Cl. 125-11.0DF.
Dunne, Michael. Head and neck restraint system. 4,477,041, Cl. 244-122.0AG.
Du Pont de Nemours, E. I., and Company: *See*—
Antonelli, Joseph A.; McLaughlin, Joseph E.; and Strolle, Clifford H., 4,477,534, Cl. 428-461.000.
Benin, Joshua, 4,476,631, Cl. 30-92.000.
Bergna, Horacio E.; and Kirkland, Joseph J., 4,477,492, Cl. 427-215.000.
Bissot, Thomas C.; and Silva, Raimund H., 4,477,321, Cl. 204-98.000.
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Dawson, Robert L., 4,477,633, Cl. 525-292.000.
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Hetherington, Brian L.; Gray, Peter H.; and Mollison, Alistair N., 4,477,407, Cl. 264-288.400.
Iwasyk, John M; and Sauerbrunn, Robert D., 4,477,271, Cl. 55-416.000.
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Murphy, Charles V., 4,477,617, Cl. 524-136.000.
Nair, Kumaran M., 4,477,296, Cl. 148-6.14R.
Parish, Darrell J., 4,477,620, Cl. 524-423.000.
Rummel, Mitzie K., 4,477,517, Cl. 428-324.000.
Smith, Dewey H., Jr., 4,477,457, Cl. 424-260.000.
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Klein, Gerhart; and Mitchell, Michael J., Jr., 4,476,624, Cl. 29-623.100.
Durham, Susan M.: *See*—
Deutsch, Alice; Brandwein, Harvey; Platt, Herbert; Hunter, Dianne M.; Dubitsky, Andrew; and Durham, Susan M., 4,477,576, Cl. 436-500.000.
Dutchburn, Leslie G. Counterbalance device for rotatable shaft. 4,476,777, Cl. 99-421.00H.
Dutt, Bulusu V., to AT&T Bell Laboratories. Light emitting device for optical switching. 4,477,824, Cl. 357-17.000.
Dykema, Owen W. Dynamic recoil damping mechanism. 4,476,969, Cl. 188-380.000.
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Kroll, Gerald; Vogel, Horst; and Peter, Jurgen, 4,476,664, Cl. 53-258.000.
E. Cacarda GmbH: *See*—
Cacarda, Jaroslav, 4,476,856, Cl. 126-447.000.
Eagle-Picher Industries, Inc.: *See*—
Miller, Lee E.; and Carr, Dennis D., 4,477,540, Cl. 429-27.000.
Wheeler, James R.; Brill, Jack N.; and Miller, Lee E., 4,477,546, Cl. 429-211.000.
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Day, Pierce B., 4,477,177, Cl. 355-11.000.
Harasta, Louis P.; Leszyk, Gerald M.; and Morrison, Edward D., 4,477,548, Cl. 430-14.000.
Henry, James W.; and Scroggin, Stanley R., 4,477,398, Cl. 264-40.100.
Jervis, Daniel A., 4,477,479, Cl. 426-549.000.
Lemke, James U., 4,477,853, Cl. 360-125.000.
Russel, Matthew J., 4,477,176, Cl. 355-3.0TR.
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Janutka, William J., 4,477,742, Cl. 307-571.000.
Moracheck, Timothy J., 4,476,748, Cl. 74-867.000.
Urban, John A.; and Sherrick, Peter L., 4,476,968, Cl. 188-329.000.
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Greenwald, Edward H., Sr.; O'Malley, William P.; and Rogers, Ross, Jr., 4,477,220, Cl. 414-139.000.
Ebauches, S.A.: *See*—
Michel, Jean-Georges; Portmann, Hubert; and Schneiter, Ali, 4,477,194, Cl. 368-69.000.
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Edwards, Lawrence K. Railway switch. 4,476,787, Cl. 104-96.000.
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Eger, Leroy O. Slide for frictional engagement with flexible descent line. 4,476,956, Cl. 182-5.000.
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Eisenhardt, William A., Jr.; Saleeb, Fouad Z.; McKay, Randal P.; and Zeller, Bary L., to General Foods Corporation. Method for producing dried citrus pulp. 4,477,481, Cl. 426-590.000.
Electric Power Research Institute: *See*—
Fessler, William A., 4,477,354, Cl. 210-634.000.
Electronic Mail Corporation of America: *See*—
Buck, Robert J., 4,477,695, Cl. 178-3.000.
Electronique Marcel Dassault: *See*—
Revirieux, Michel, 4,477,774, Cl. 324-158.00P.
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Hall, David A., 4,477,660, Cl. 544-28.000.
El-Kareh, Badih, to International Business Machines Corporation. Method of fabricating a bipolar dynamic memory cell. 4,476,623, Cl. 29-576.00W.
Elkin, Robert D., to Monogram Industries, Inc. Variable speed inlet control valve. 4,476,942, Cl. 173-169.000.
Elkins, Marvin: *See*—
Smith, Dwight, 4,476,976, Cl. 206-219.000.
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Elyakim, Amir. Fifth wheel coupling apparatus. 4,477,100, Cl. 280-434.000.
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Reinke, Friedhelm; and Emde, Friedhelm, 4,476,824, Cl. 123-90.390.
Emery, Leonard W., to Atlantic Richfield Company. Method of cold water fracturing in drainholes. 4,476,932, Cl. 166-303.000.
Endo, Hiroshi, to Nissan Motor Company, Limited. Obstacle detection system for use in vehicles. 4,477,184, Cl. 356-141.000.
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Knight, Howard W.; and Engberg, Edwin W., 4,477,847, Cl. 360-60.000.
English, Larry W.: *See*—
Michl, Michael J.; and English, Larry W., 4,477,408, Cl. 264-532.000.
Enomoto, Nizo; and Murayama, Fumiaki, to Nippondenso Co., Ltd. Fuel-injecting apparatus. 4,476,836, Cl. 123-502.000.
Epps, Tim. Refrigerator condensation apparatus. 4,476,695, Cl. 62-512.000.
Ernst, Alfons, to Johannes Heidenhain GmbH. Photoelectric incremental measuring device. 4,477,189, Cl. 356-374.000.
Ernst Leitz Wetzlar GmbH: *See*—
Gaul, Norbert, 4,477,157, Cl. 350-532.000.
Ersfeld, Heinrich; and Schulte, Klaus, to Bayer Aktiengesellschaft. Mixing head for mixing at least two flowable components. 4,477,191, Cl. 366-77.000.
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Espiritu, Hermenegildo A., to International Telephone & Telegraph Corporation. Self-locking connector. 4,477,140, Cl. 339-89.00M.
Estabrooks, Dennis C.: *See*—
Arter, Nelson K.; Estabrooks, Dennis C.; and Jackson, William G., 4,477,068, Cl. 271-186.000.

ETA S.A., Fabriques d'Ebauches: *See*—
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Europtool Trust: *See*—
Arabian, Sandro, 4,477,000, Cl. 222-135.000.
Eurosil Electronic GmbH: *See*—
Hentzschel, Hanspeter; and Hainzlmaier, Hermann, 4,476,765, Cl. 84-1.030.
Euvrard, Hubert, to Micro-Mega S.A. Device for quick coupling of dental appliance. 4,477,253, Cl. 433-126.000.
Evans, James M.; Krajca, Kenneth E.; Ukkonen, Keijo A.; and Hansen, James E., to Sylvachem Corporation. Stabilization of tackifying resin dispersions. 4,477,613, Cl. 524-77.000.
Evstafiev, Evgeny A.: *See*—
Ivanov, Jury P.; Averbukh, Anatoly B.; Evstafiev, Evgeny A.; and Tarasov, Alexandr E., 4,476,797, Cl. 114-65.00R.
Extracorporeal Medical Specialties, Inc.: *See*—
Aid, James D., 4,476,685, Cl. 62-3.000.
Exxon Research and Engineering Co.: *See*—
Hafez, Mahmoud M., 4,477,333, Cl. 208-30.000.
Madon, Rostam J., 4,477,595, Cl. 518-715.000.
Ezis, Andre, to Ford Motor Company. Method of making silicon nitride comprising objects. 4,477,402, Cl. 264-65.000.
Failla, Stephen J.; Jewusiak, Stephen J.; and Zwaskis, William J., to Ethicon, Inc. Non-metallic, bio-compatible hemostatic clips. 4,476,865, Cl. 128-326.000.
Fairchild Camera & Instrument Corporation: *See*—
Au, Alexander C., 4,477,886, Cl. 365-222.000.
Sharp, Kenneth P., 4,477,885, Cl. 365-204.000.
Faithfull, Terence F. H.: *See*—
Darcy, Kevin A.; and Faithfull, Terence F. H., 4,477,044, Cl. 244-223.000.
Fanselow, Dan L.; Cobb, Sanford, Jr.; and Bergsten, Ronald E., to Minnesota Mining and Manufacturing Company. Tanning blanket. 4,476,593, Cl. 5-417.000.
Farley, Donald J.: *See*—
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Farmitalia Carlo Erba S.p.A.: *See*—
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Fast, Jacob. Support hook and assembly for merchandising display. 4,476,983, Cl. 211-57.100.
Fathergill, Rex D.: *See*—
Bowlds, Patsy A.; Dunn, David P.; Fathergill, Rex D.; Findlay, Hugh T.; and Stafford, Donald W., 4,477,198, Cl. 400-120.000.
Fazekas, Peter, to Siemens Aktiengesellschaft. Method and apparatus for a fast internal logic check of integrated circuits. 4,477,775, Cl. 324-158.00R.
Fecan, Jean C.; and Morin, Jean, to Commissariat a l'Energie Atomique. Apparatus for storing and producing hydrogen from a solid compound. 4,477,415, Cl. 422-164.000.
Feder, Ernest; and Thibeault, Claude E., to United Technologies Corporation. Seal ring with slidable inner element bridging circumferential gap. 4,477,086, Cl. 277-26.000.
Federal Paper Board Company, Inc.: *See*—
Growney, Lawrence J., 4,477,016, Cl. 229-28.00R.
Manizza, Guelfo A., 4,476,977, Cl. 206-434.000.
Federici, Giorgio: *See*—
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Fehr, Werner, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH. Air diffuser assembly. 4,476,773, Cl. 98-2.080.
Feinwerktechnik Schleicher & Co., Firma: *See*—
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Ferguson, George R.; and Royer, William W., to Duff-Norton Company, Inc. Rotating joint with separated bearings and seals. 4,477,107, Cl. 285-134.000.
Fermod: *See*—
Beauchot, Pierre, 4,476,652, Cl. 49-235.000.
Fernandez, Julio A., to National Starch and Chemical Corporation. Nonpigmented wood stains. 4,477,282, Cl. 106-34.000.
Ferrebee, David H. Football place/field goal kicking device. 4,477,077, Cl. 273-55.00B.
Fesman, Gerald, to Stauffer Chemical Company. Polyurethane foams having low scorch discoloration. 4,477,600, Cl. 521-108.000.
Fessler, William A., to Electric Power Research Institute. Destruction of polychlorinated biphenyls during solvent distillation. 4,477,354, Cl. 210-634.000.
Field, Norman John: *See*—
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Bowlds, Patsy A.; Dunn, David P.; Fathergill, Rex D.; Findlay, Hugh T.; and Stafford, Donald W., 4,477,198, Cl. 400-120.000.
Finney, Philip F. Thermocouple and method of making the thermocouple and of mounting the thermocouple on a heat exchanger tube. 4,477,687, Cl. 136-229.000.
Fire Out Enterprises Company, Inc.: *See*—
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Longo, Trent F.; Sagar, Vispi R.; and Stayer, Mark L., 4,477,656, Cl. 528-487.000.
Fischer, Rudolf; and Puschnerat, Helmut, to Albert-Frankenthal AG. Apparatus for separating overlapped sheets of folded products. 4,477,066, Cl. 270-52.000.
Fischer, William C.: *See*—
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Fisher, James M. Joist girder building construction. 4,476,662, Cl. 52-693.000.
Fishman, Steven J. Method for coloring fish flesh. 4,477,475, Cl. 426-250.000.
Fisk, Thomas E., to Dow Chemical Company, The. Stable dispersions of polymers in polyfunctional active hydrogen compounds and polyurethanes based thereon. 4,477,603, Cl. 521-137.000.
Fitzgerald, Raphael V.: *See*—
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Fitzpatrick, Patrick C.: *See*—
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Fleming, James W., Jr., to AT&T Bell Laboratories. Method for making germanium-silicate gel glass and articles. 4,477,580, Cl. 501-12.000.
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Berry, William W.; Ashworth, Robert A.; and Spake, Ned B., 4,477,425, Cl. 423-485.000.
Floyd, Middleton B., Jr.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., to American Cyanamid Company. Vinylstannyl derivatives. 4,477,388, Cl. 260-429.700.
Fogarty, Thomas J.: *See*—
Chin, Albert K., 4,476,866, Cl. 128-344.000.
Foller, Peter C., to Chevron Research Company. Process for producing hydrogen chloride. 4,477,322, Cl. 204-103.000.
Fons, Lloyd C. Methods for locating oil or gas deposits employing temperature and/or geothermal gradient measurements. 4,476,716, Cl. 73-154.000.
Ford Motor Company: *See*—
Boaz, Premakaran T., 4,477,486, Cl. 427-54.100.
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Fortune, William S. Combination tip wrench and stand. 4,476,596, Cl. 7-138.000.
Foslien, Floyd L., to Minnesota Mining and Manufacturing Company. Stapler with intermediate latching mechanism. 4,477,007, Cl. 227-19.000.
Fossati, Norberto: *See*—
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Foster, Derek; and Rich, Colin, to John T. Hepburn Limited. Mooring device. 4,476,801, Cl. 114-230.000.
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Fox, Katharine A.: *See*—
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Fraioli, Anthony V., to United States of America, Energy. Solid electrolyte structure. 4,477,541, Cl. 429-33.000.
Fraioli, Donato M., to Air Structures International Inc. Air supported structures having internal liners. 4,477,503, Cl. 428-102.000.
France Bed Co., Ltd.: *See*—
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Francovitch, Thomas F. Membrane anchor with flexure resisting regions. 4,476,660, Cl. 52-515.000.

Fransson, Lars H.: *See—*
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Frantz, James S., to Tread Corporation. Security cabinet for storage of valuables. 4,477,130, Cl. 312-219.000.
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Friedrich, Hans-Joachim, to J. F. Adolff AG. Method of bonding a floor-covering web with a backing web. 4,477,299, Cl. 156-72.000.
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Friess, Jean, to Matkemi AG. Sealing device for valves. 4,477,057, Cl. 251-306.000.
Frisbee, Belmont, Jr.; and Swedblom, Charles E., to United States of America, Navy. Signal acquisition and tracking system. 4,477,812, Cl. 343-417.000.
Fromageries Bel-La Vache Qui Rit: *See—*
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Frye, Robert B., to General Electric Company. Dual component coating system. 4,477,519, Cl. 428-331.000.
Frye, Robert B., to General Electric Company. Silicone resin coating composition especially suited for primerless adhesion to cast acrylics. 4,477,528, Cl. 428-412.000.
Fuji Electric Co., Ltd.: *See—*
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Fujimori, Kyoichi; and Okano, Masami, to Diesel Kiki Co., Ltd. Timing control device for a fuel injection pump. 4,476,832, Cl. 123-502.000.
Fujimoto, Teruo, to Toyo Soda Manufacturing Co., Ltd. Amphoteric ion exchanger and method of making same. 4,477,596, Cl. 521-25.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Ueda, Ikuo; Teraji, Tsutomu; Takaya, Takao; Takai, Keiji; Takasugi, Hisashi; Shimojo, Fumio; and Nishino, Shigetaka, 4,477,447, Cl. 424-246.000.
Fujita, Kenjiro. Method for producing oil from rice embryo-buds. 4,477,386, Cl. 260-412.200.
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Fukayama, Miyoji; Suganuma, Noriyuki; and Saruyama, Toshio, to Toray Silicone Co., Ltd. Water resistant room temperature vulcanizable polyorganosiloxane compositions and method for preparing same. 4,477,606, Cl. 523-200.000.
Fukuda, Hirokazu; Shinohara, Koji; Kawabata, Yoshio; Nishijima, Yoshito; and Yamamoto, Kosaku, to Fujitsu Limited. Laser apparatus. 4,477,730, Cl. 250-504.00R.
Fukumoto, Masafumi, to Nissin Jabara Industries Co., Ltd. Exhaust gas suppressor. 4,476,838, Cl. 123-556.000.
Fukushima, Takashi: *See—*
Matsuura, Tamiaki; Aiba, Takeshi; Fukushima, Takashi; Nishimura, Masanori; Ohtsuki, Hiroshi; Yabuki, Fujio; and Kusakabe, Tomio, 4,476,627, Cl. 29-791.000.
Fukushima, Yoneharu: *See—*
Wakai, Kiyoshi; Shimodaira, Toshirou; and Fukushima, Yoneharu, 4,477,747, Cl. 315-200.00A.
Fultz, Clinton: *See—*
Moore, Franklin, Jr.; and Fultz, Clinton, 4,476,996, Cl. 221-61.000.
Fumakilla Limited: *See—*
Muramoto, Takayoshi; Nishino, Shingi; Sasaki, Toshiyuki; and Sasaki, Takanori, 4,477,414, Cl. 422-125.000.
Funk, James E., to Alfred University Research Foundation, Inc. Grinding mixture and process for preparing a slurry therefrom. 4,477,259, Cl. 44-51.000.
Funk, James E., to Alfred University Research Foundation, Inc. Process for preparing a carbonaceous slurry. 4,477,260, Cl. 44-51.000.
Funk, Roger S., to R. Funk and Co., Inc. Diazo printer with improved ammonia supply system. 4,477,166, Cl. 354-300.000.
Furuichi, Katsushi; Yokomizo, Yoshikazu; Honma, Toshio; and Murakami, Katsumi, to Canon Kabushiki Kaisha. Image forming apparatus. 4,477,178, Cl. 355-14.00R.
Furukawa, Hisao: *See—*
Kato, Yasushi; and Furukawa, Hisao, 4,477,628, Cl. 525-100.000.
Furukawa, Yasuhiko: *See—*
Sugihara, Taizo; Furukawa, Yasuhiko; and Tomioka, Susumu, 4,477,516, Cl. 428-296.000.
Fushida, Akira; Kato, Yoshiaki; and Kamezaki, Yasushi, to MHA Industrial Co., Ltd. Photosensitive layer for electrophotography. 4,477,551, Cl. 430-133.000.
Futober Epuletgepeszeti Termekeket Gyarto Vallalat: *See—*
Makara, Gyorgy, 4,477,020, Cl. 236-49.000.
Gabriele, Leonard A. Broaching machine safety. 4,477,215, Cl. 409-245.000.
Gage, John W. Tiller control device. 4,476,800, Cl. 114-172.000.
Galia, Karl, to Wella Aktiengesellschaft. Valve for pressurized container. 4,477,001, Cl. 222-402.100.
Gamewell, Joseph M.: *See—*
Heilig, Glenn M., Jr.; and Gamewell, Joseph M., 4,476,922, Cl. 165-104.250.
Gamson, Nicolette: *See—*
Chudy, Elzbeita; Gamson, Nicolette; and Kellner, Phillip R., 4,477,309, Cl. 156-635.000.
Garavaglia, Carlo: *See—*
Garlaschelli, Luigi; Gozzo, Franco; Mendillo, Vincenzo; Garavaglia, Carlo; Mirenna, Luigi; and Zagni, Angela, 4,477,461, Cl. 424-272.000.
Garcia, Silverio M., to Capetrol International, Inc. Acidic glass cleaning composition. 4,477,364, Cl. 252-142.000.
Garlaschelli, Luigi; Gozzo, Franco; Mendillo, Vincenzo; Garavaglia, Carlo; Mirenna, Luigi; and Zagni, Angela, to Montedison S.p.A. N-Aryl-N-acyl-3-amino-1,3-oxazolidine-2-thiones having fungicidal activity. 4,477,461, Cl. 424-272.000.
Garnicki, Ronia: *See—*
Hanig, Richard E., 4,477,511, Cl. 428-201.000.
Garrett Corporation, The: *See—*
McInerney, Charles E., 4,476,682, Cl. 60-602.000.
Garrett, David L., Jr.: *See—*
Cassatta, Joseph C.; Garrett, David L., Jr.; and van Oene, Henk, 4,477,327, Cl. 204-159.150.
Garrett, John S. Storage rack. 4,476,984, Cl. 211-86.000.
Gasser, Ruedy: *See—*
Greutert, Albert; and Gasser, Ruedy, 4,476,776, Cl. 99-302.00C.
Gates, James T. Hot spray apparatus. 4,477,023, Cl. 239-340.000.
Gaul, Carl J.: *See—*
Whaley, John P.; and Gaul, Carl J., 4,477,339, Cl. 209-22.000.
Gaul, Norbert, to Ernst Leitz Wetzlar GmbH. Universal revolving stage for microscopes. 4,477,157, Cl. 350-532.000.
Gavin, James R.: *See—*
Reimann, George J.; Benoit, Gordon L.; Gavin, James R.; and Schneider, Michael A., 4,476,979, Cl. 206-554.000.
Gebelein, Rolin J.; and Shafer, David, to Gebelein, Rolin J. Reflecting telescope with correcting lens. 4,477,156, Cl. 350-503.000.

Gebhardt, Ulrich: *See—*
Richter, Gerhard; Luft, Gunter; and Gebhardt, Ulrich, 4,477,314, Cl. 204-1.00T.
Gebr. Happich GmbH: *See—*
Viertel, Lothar; and Mahler, Gert, 4,477,116, Cl. 296-97.00H.
Gee, Ronald P.; and Kalinowski, Robert E., to Dow Corning Corporation. Method for treating cellulosic textile fabrics with aqueous emulsions of carboxyfunctional silicone fluids. 4,477,514, Cl. 428-264.000.
Gehlhaus, Juergen; and Kieser, Manfred, to Merck Patent Gesellschaft mit Beschrankter Haftung. Photosensitive hydroxyalkylphenones. 4,477,681, Cl. 568-336.000.
Gehman, David R.: *See—*
Sanderson, F. Thomas.; and Gehman, David R., 4,477,622, Cl. 524-522.000.
Geibel, Wolfram: *See—*
Herrmann, Wolfgang; Geibel, Wolfram; and Satzinger, Gerhard, 4,477,661, Cl. 544-49.000.
Geiss, Vernon L.: *See—*
Gravely, Lawrence E.; and Geiss, Vernon L., 4,476,881, Cl. 131-308.000.
Geist, Michael; and Diefenbach, Horst, to BASF Farben & Fasern AG. Selfcrosslinking heat-hardenable binder. 4,477,642, Cl. 528-61.000.
Geist, Michael: *See—*
Diefenbach, Horst; and Geist, Michael, 4,477,530, Cl. 428-413.000.
Gelbein, Abraham P.: *See—*
Greene, Marvin I.; and Gelbein, Abraham P., 4,477,594, Cl. 518-700.000.
General Binding Corporation: *See—*
Wang, James C., 4,477,506, Cl. 428-172.000.
General Electric Company: *See—*
Bose, Sanjay K., 4,477,809, Cl. 340-825.540.
Bovenkerk, Harold P., 4,476,656, Cl. 51-325.000.
Brealey, Robert H., 4,477,692, Cl. 174-31.00R.
Campbell, Richard W., 4,477,529, Cl. 428-412.000.
Carreno, Diether E., 4,477,226, Cl. 416-144.000.
Castonguay, Roger N.; and Jencks, Charles L., 4,477,701, Cl. 200-50.0AA.
Cline, Harvey E., 4,477,324, Cl. 204-129.100.
Cotzas, George M., 4,477,767, Cl. 322-59.000.
DePuy, Robert P., 4,477,856, Cl. 361-72.000.
Doin, James E.; and Vaughn, Howard A., Jr., 4,477,499, Cl. 427-412.100.
Frye, Robert B., 4,477,519, Cl. 428-331.000.
Frye, Robert B., 4,477,528, Cl. 428-412.000.
Haaf, William R.; Lee, Gim F., Jr.; and Cooper, Glenn D., deceased, 4,477,627, Cl. 525-67.000.
Hershberger, Doran D., 4,476,736, Cl. 74-341.000.
Kim, Wontaik, 4,477,707, Cl. 219-10.55A.
Klufas, Oleg, 4,477,227, Cl. 416-198.00A.
Lillquist, Robert D.; and Penney, Carl M., 4,477,712, Cl. 219-124.340.
Lockhart, Thomas P., 4,477,625, Cl. 524-789.000.
Mark, Victor, 4,477,632, Cl. 525-147.000.
Mark, Victor; and Hedges, Charles V., 4,477,647, Cl. 528-176.000.
Mobley, David P., 4,477,649, Cl. 528-212.000.
Mobley, David P., 4,477,650, Cl. 528-215.000.
Rediger, Alvin L., 4,477,306, Cl. 156-578.000.
Shah, Rasiklal P.; and Gleason, Cynthia L., 4,476,683, Cl. 60-648.000.
Smith, Peter H., 4,476,946, Cl. 177-144.000.
Steigerwald, Robert L., 4,477,868, Cl. 363-28.000.
Taylor, Carl D., 4,477,143, Cl. 339-126.0RS.
White, Dwain M.; and Nye, Susan A., 4,477,651, Cl. 528-215.000.
General Foods Corporation: *See—*
Eisenhardt, William A., Jr.; Saleeb, Fouad Z.; McKay, Randal P.; and Zeller, Bary L., 4,477,481, Cl. 426-590.000.
Saladini, Joseph J.; Parnell, John V., III; Steensen, Wayne L.; and Topalian, Harry H., 4,477,474, Cl. 426-250.000.
Schoonmaker, C. Donald; and Bortkevicius, Jonas, 4,477,473, Cl. 426-231.000.
Seidel, William C.; Orozovich, George E.; and Medcalf, Darrell G., 4,477,480, Cl. 426-578.000.
General Instrument Corporation: *See—*
O'Brien, Thomas E., 4,477,800, Cl. 340-533.000.
Rocci, Joseph D.; and Crook, Stephen E., 4,477,799, Cl. 340-533.000.
General Motors Corporation: *See—*
Bonvallet, Duane J., 4,476,822, Cl. 123-90.410.
Cleveland, Dixon; Havens, James R.; Nagel, Gregory L.; Decina, Basil A., Jr.; and Jenuwine, William C., 4,477,709, Cl. 219-109.000.
Gutterman, Jeffrey S., 4,476,711, Cl. 73-35.000.
Luyckx, Robert R., 4,477,099, Cl. 280-421.000.
Nagy, Louis L.; Eddy, David S.; and O'Rourke, Michael J., 4,477,771, Cl. 324-58.50C.
Van Duyn, Paul D.; and Johnson, Jerry J., Sr., 4,477,864, Cl. 362-311.000.
General Signal Corp.: *See—*
Jandrasi, Frank J., 4,477,053, Cl. 251-86.000.
Georgel, Gaston P. V.; and Guyonnet, Marcel A. R., to Fromageries Bel-La Vache Qui Rit. Apparatus for molding curd for the manufacture of cheeses of small size. 4,477,241, Cl. 425-85.000.
Gerber, Dennis H., to Burke Industries, Inc. Reservoir cover with tensioned plates. 4,476,992, Cl. 220-219.000.
Gerber Garment Technology, Inc.: *See—*
Pearl, David R.; and Wolfson, Lawrence S., 4,476,756, Cl. 83-422.000.
Gerber, Hermann, to Sodeco-Saia, A.G. Permanent magnet rotor with gaps between the magnet and the hub. 4,477,744, Cl. 310-156.000.
Gerlach, Hans-Jurgen: *See—*
Baumann, Heinz; and Gerlach, Hans-Jurgen, 4,477,923, Cl. 378-95.000.
Gersbach, John E.: *See—*
Cottrell, Peter E.; Gersbach, John E.; and Pricer, Wilbur D., 4,477,846, Cl. 360-46.000.
Gesior, Augustyn M.: *See—*
Robinson, Edward L., Jr.; and Gesior, Augustyn M., 4,477,801, Cl. 340-684.000.
GFK Partnership: *See—*
Kleuver, Guenther F., 4,477,109, Cl. 285-361.000.
Giachino, Joseph M.; and Keyes, Marion A., IV, to Babcock & Wilcox Company, The. Flame monitoring safety, energy and fuel conservation system. 4,477,245, Cl. 431-78.000.
Giardino, David A.: *See—*
Wallace, William K.; and Giardino, David A., 4,477,096, Cl. 279-97.000.
Gibbs, Marylu B., to Dow Chemical Company, The. Surface-area stabilization of fumed silica. 4,477,412, Cl. 422-40.000.
Giboulet, Andre ; Henry, Georges; and Kieffer, Jean, to Merlin Gerin. High tension metal-clad installation subdivided into tight compartments. 4,477,691, Cl. 174-22.00C.
Gibson, Clark W.: *See—*
Strange, Carl P.; Messelt, Christopher D.; and Gibson, Clark W., 4,477,657, Cl. 536-91.000.
Gibson, John M.; Poate, John M.; and Tung, Raymond T., to AT&T Bell Laboratories. Heteroepitaxy of multiconstituent material by means of a template layer. 4,477,308, Cl. 156-603.000.
Gibson, Walter G.: *See—*
Chen, Thomas Y.; and Gibson, Walter G., 4,477,841, Cl. 358-335.000.
Giem, David A.; Aaronson, Barry L.; and Jones, Charles K. Apparatus for sensing and indicating vaginal muscle contraction. 4,476,880, Cl. 128-778.000.
Giessen, Michael J. V.: *See—*
Juba, Bernard T.; and Giessen, Michael J. V., 4,476,657, Cl. 52-139.000.
Giffard, Philip J., to Mineral Deposits Limited. Spiral separator. 4,476,980, Cl. 209-459.000.
Gilmer, Andre ; Romand-Monnier, Jacques; and Lejeune, Jean-Pierre, to Alsthom-Atlantique. Submerged motor-pump unit. 4,477,235, Cl. 417-414.000.
Ginn, Michael W. Reducing slurry viscosity of kaolinitic clays. 4,477,422, Cl. 423-327.000.
Girard, Herve : *See—*
Calabro, Max; Girard, Herve ; and Le Corre, Alain, 4,477,025, Cl. 239-265.350.
Giri, Ronald R.: *See—*
Casper, Paul W.; Toy, James W.; Orlando, Fred J., Jr.; and Giri, Ronald R., 4,477,895, Cl. 370-16.000.
Giroux, Claude, to Texas Turbine, Inc. Sealing system for a turboexpander compressor. 4,477,223, Cl. 415-169.00R.
Givaudan Corporation: *See—*
Virgilio, Joseph A.; and Heilweil, Emanuel, 4,477,683, Cl. 568-379.000.
Glass Containers Corporation: *See—*
Ali-Zaidi, Syed R., 4,477,494, Cl. 427-255.300.
Glasurit America, Inc.: *See—*
Wright, Howard J.; Leonard, David P.; and Etzell, Roger A., 4,477,536, Cl. 428-522.000.
Glatt Maschinen-und Apparatebau AG: *See—*
Glatt, Werner; and Grab, Erwin, 4,476,804, Cl. 118-19.000.
Glatt, Werner; and Grab, Erwin, to Glatt Maschinen-und Apparatebau AG. Process of coating of particles, particularly particles of medicinal drugs, and apparatus for implementation of the process. 4,476,804, Cl. 118-19.000.
Glattli, Hans-Heinrich: *See—*
Stoll, Kurt; and Glattli, Hans-Heinrich, 4,477,404, Cl. 264-220.000.
Gleason, Cynthia L.: *See—*
Shah, Rasiklal P.; and Gleason, Cynthia L., 4,476,683, Cl. 60-648.000.
Gleason, Edward H.: *See—*
Sinclair, Alvin R.; and Gleason, Edward H., 4,477,535, Cl. 428-476.300.
Gleave, Dorothy. Composition for and a method of treating hair and/or scalps. 4,477,436, Cl. 424-95.000.
Glenn, William E., to New York Institute of Technology. Transducer device. 4,477,783, Cl. 333-138.000.
Glennon, Timothy F.; Peterson, William J.; and Thom, James B., to Sundstrand Corporation. Voltage regulator. 4,477,765, Cl. 322-20.000.
Gloeckler, Alfred, to Superba S.A. Home knitting machine. 4,476,696, Cl. 66-75.200.
Glover, Douglas W.: *See—*
Bowen, Terry P.; Caron, Bernard G.; Glover, Douglas W.; and Hoffer, John C., 4,477,146, Cl. 350-96.210.
Gobbi, Gioacchino, to Grivel S.r.l. Mountaineering implement. 4,476,597, Cl. 7-159.000.
Goddard, John B., to Union Carbide Corporation. Salt roasting of vanadium ore in the presence of carbon. 4,477,416, Cl. 423-67.000.

Goddard, Lawrence A. Refrigerant recovery and purification system. 4,476,688, Cl. 62-149.000.

Goel, Anil B.; and Richards, Harvey J., to Ashland Oil, Inc. Preparation of carboxylic acid anhydrides. 4,477,382, Cl. 260-398.000.

Goel, Anil B.; and Pettiford, Michael E., to Ashland Oil, Inc. Manufacture of higher aryl esters. 4,477,385, Cl. 260-410.90R.

Gold, Elijah H.; and Chang, Wei K., to Schering Corp. Esters of substituted 8-hydroxy-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepines. 4,477,378, Cl. 260-239.0BB.

Gold, Marvin H. Castable mixture for insulating spliced high voltage cable. 4,477,376, Cl. 252-572.000.

Golda, Eugene: *See*—
Chu, Simon L.; Golda, Eugene; Huang, Jen-Chi; and Wilkes, Alan, 4,477,317, Cl. 204-33.000.

Goldhammer, Albert, to Feinwerktechnik Schleicher & Co., Firma. Closure indicator for the door of a baling press. 4,477,702, Cl. 200-61.620.

Goldstein, Joseph. Stretch-wrap film dispenser. 4,477,037, Cl. 242-75.400.

Golec, Frederick A., Jr.: *See*—
Auerbach, Joseph; and Golec, Frederick A., Jr., 4,477,675, Cl. 548-480.000.

Gollinger, Wolfgang; and Mlynek, Daniel, to ITT Industries, Inc. Fast MOS driver stage for digital signals. 4,477,735, Cl. 307-270.000.

Gomi, Shimpei; Takeuchi, Tomomitsu; Matsuo, Itaru; Fujii, Masaki; Takatsuka, Toru; and Watari, Ryuzo, to Fuji Oil Co., Ltd.; Fuji Standard Research Inc.; and Chiyoda Chemical Engineering & Construction Co., Ltd. Thermal cracking of heavy hydrocarbon oils. 4,477,334, Cl. 208-75.000.

Gonzales, Roman Y., to Gould Inc. Backplane connector. 4,477,862, Cl. 361-393.000.

Gonzalez, Carlos F., to Microlife Technics, Inc. Preservation of foods with non-lactose fermenting *Streptococcus Lactis* subspecies *diacetilactis*. 4,477,471, Cl. 426-43.000.

Gonzalez, Pedro A. Rotary payout device for recreational machines. 4,476,884, Cl. 133-4.00A.

Gonzalez, Ruben J.: *See*—
Borras, Jaime A.; and Gonzalez, Ruben J., 4,477,919, Cl. 377-47.000.

Goodall Rubber Company: *See*—
Castelbaum, Leonard; Ostrowski, Joseph M.; and Bedson, Joseph H., Jr., 4,477,108, Cl. 285-149.000.

Gooden, Judith L.: *See*—
Bopp, Kenneth C.; Gooden, Judith L.; and Kulkarni, Narayan M., 4,476,621, Cl. 29-571.000.

Goodstine, Stephen L.: *See*—
Borio, Richard W.; and Goodstine, Stephen L., 4,476,790, Cl. 110-245.000.

Goralnik, Charles D., to Vogue Lighting, Inc. Chandeliers. 4,477,866, Cl. 362-427.000.

Gordon, Roy E., to Oxford Research Systems Limited. Analysis of biological material. 4,477,777, Cl. 324-300.000.

Gorman, Gerald W.; and Herrmann, Walter J., to Corbett Elevator Manufacturing Co., Inc. Caging seal for hydraulic elevator or the like. 4,476,772, Cl. 92-168.000.

Gorog, Istvan, to RCA Corporation. Multi-bandwidth optical playback apparatus having minimum baseband distortion. 4,477,891, Cl. 369-109.000.

Goto, Kiyoshi: *See*—
Yamamoto, Takeshi; Goto, Kiyoshi; and Uehara, Masafumi, 4,477,553, Cl. 430-192.000.

Gotz, Udo: *See*—
Hoffman, Dietrich; and Gotz, Udo, 4,476,785, Cl. 102-522.000.

Gotze, Gerd-Wolfgang, to Robert Bosch GmbH. Audiometer. 4,476,724, Cl. 73-585.000.

Gould Inc.: *See*—
Barker, John M., 4,476,877, Cl. 128-736.000.
Gonzales, Roman Y., 4,477,862, Cl. 361-393.000.

Gouttebessis, Jacques: *See*—
Cesar, Jean P.; Gouttebessis, Jacques; and Schneider, Andre, 4,476,908, Cl. 152-357.00A.

Gozzo, Franco: *See*—
Garlaschelli, Luigi; Gozzo, Franco; Mendillo, Vincenzo; Garavaglia, Carlo; Mirenna, Luigi; and Zagni, Angela, 4,477,461, Cl. 424-272.000.

Grab, Erwin: *See*—
Glatt, Werner; and Grab, Erwin, 4,476,804, Cl. 118-19.000.

Grable, William A. Fabricated reciprocating piston pump. 4,477,237, Cl. 417-539.000.

Graham, Robert S., to Anderson Strathclyde PLC. Control system for eddy current coupling drive for armoured face conveyors. 4,477,734, Cl. 307-120.000.

Grantham, LeRoy F.; and McKenzie, Donald E., to Rockwell International Corporation. Molten salt hazardous waste disposal process utilizing gas/liquid contact for salt recovery. 4,477,373, Cl. 252-626.000.

Gratz, Eugene J.: *See*—
Duffy, Brian J.; Gratz, Eugene J.; Potter, Steven E.; and Power, Royal A., 4,477,228, Cl. 416-241.00A.

Gravely, Lawrence E.; and Geiss, Vernon L., to Brown & Williamson Tobacco Corporation. Microbial digestion of tobacco materials using mixed cultures. 4,476,881, Cl. 131-308.000.

Gray, Peter H.: *See*—
Hetherington, Brian L.; Gray, Peter H.; and Mollison, Alistair N., 4,477,407, Cl. 264-288.400.

Gray Tool: *See*—
Bridges, Charles D.; Karr, Michael A., Jr.; and Morrison, Bert L., 4,477,085, Cl. 277-22.000.

Gray Tool Company: *See*—
Adamek, Frank C., 4,477,091, Cl. 277-211.000.
Adamek, Frank C., 4,477,093, Cl. 277-211.000.
Bush, Robert E., 4,477,092, Cl. 277-211.000.

Green, Douglas F., to Rover-Scott Bonnar Limited. Shredding machine. 4,477,029, Cl. 241-101.700.

Green, Philip S.: *See*—
Taenzer, Jon C.; Burch, Donald J.; and Green, Philip S., 4,476,874, Cl. 128-663.000.

Green, William G., deceased (by Jones, Melissa, legal representative), to Dimar Holding Corporation. Method and apparatus for solvent generation and recovery of hydrocarbons. 4,476,928, Cl. 166-267.000.

Greene, Marvin I.; and Gelbein, Abraham P., to Chem Systems, Inc. Process for the synthesis of aliphatic alcohol-containing mixtures. 4,477,594, Cl. 518-700.000.

Greenwald, Edward H., Sr.; O'Malley, William P.; and Rogers, Ross, Jr., to Eavenson, Auchmuty & Greenwald. Method and apparatus for unloading burden from a tow comprised of barges. 4,477,220, Cl. 414-139.000.

Greshof, Heinrich: *See*—
Meermoller, Theodor; and Greshof, Heinrich, 4,476,808, Cl. 119-14.180.

Greskovich, Eugene J.: *See*—
Kumar, Ravi; Sircar, Shivaji; White, Thomas R.; and Greskovich, Eugene J., 4,477,265, Cl. 55-26.000.

Greutert, Albert; and Gasser, Ruedy, to Maxs AG. Centrifuge cage for a coffee centrifuge. 4,476,776, Cl. 99-302.00C.

Grisham, James D.: *See*—
Diacont, George P., Jr.; and Grisham, James D., 4,476,792, Cl. 112-142.000.

Grisolano, James M., Jr.: *See*—
Pollock, Stephen C.; Grisolano, James M., Jr.; and Peyman, Gholman A., 4,477,158, Cl. 351-169.000.

Griswold, Roger W., II. Vortex alleviating wing tip. 4,477,042, Cl. 244-199.000.

Grivel S.r.l.: *See*—
Gobbi, Gioacchino, 4,476,597, Cl. 7-159.000.

Grollier, Jean F., to L'OREAL. Cleaning product for the hair and skin, based on acylisethionates and cationic polymers. 4,477,375, Cl. 252-542.000.

Grosner, George J., to Vitta Corporation. Shapes for sealing or joining materials together. 4,477,527, Cl. 428-401.000.

Gross, Frank R. Boundary air layer modification structure for heat transfer roll. 4,476,636, Cl. 34-114.000.

Grosskinsky, Otto-Alfred; Frommer, Elmar; Rapp, Gunther; and Thomas, Erwin, to BASF Aktiengesellschaft. Continuous preparation of hydroxylammonium salts. 4,477,424, Cl. 423-387.000.

Grove Valve and Regulator Company: *See*—
Brumm, Richard S., 4,476,730, Cl. 73-861.610.

Grow, Harlow B. Emulsion separation method and apparatus. 4,477,356, Cl. 210-741.000.

Growney, Lawrence J., to Federal Paper Board Company, Inc. Cellular display structure. 4,477,016, Cl. 229-28.00R.

Grubbs, Calvin E., to Thomas Industries, Inc. Solid state ballast. 4,477,748, Cl. 315-306.000.

Gruber, William P.: *See*—
Bell, Lon E.; and Gruber, William P., 4,477,715, Cl. 219-205.000.

Grudzinskas, Charles V.: *See*—
Floyd, Middleton B., Jr.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,477,388, Cl. 260-429.700.

Gruenberg, Elliot L., to BroadCom, Incorporated. Successive frame digital multiplexer with increased channel capacity. 4,477,900, Cl. 370-112.000.

Grumman Aerospace Corporation: *See*—
Karanik, James J., 4,477,040, Cl. 244-58.000.

GSW Inc.: *See*—
Tilton, Robert W., 4,477,399, Cl. 264-45.200.

GTE Communications Products Corporation: *See*—
Bopp, Kenneth C.; Gooden, Judith L.; and Kulkarni, Narayan M., 4,476,621, Cl. 29-571.000.

GTE Laboratories Inc.: *See*—
Cogan, Adrian I., 4,476,622, Cl. 29-571.000.

GTE Network Systems Corporation: *See*—
Crocker, Angus M., 4,477,857, Cl. 361-119.000.

GTE Products Corporation: *See*—
Sweeney, Harold E., 4,477,905, Cl. 372-25.000.

Guerin, Yves; and Meister, Pierre-Andre , to ETA S.A., Fabriques d'Ebauches. Stepping motor unit. 4,477,759, Cl. 318-696.000.

Gumbert, Hans; and Eufinger, Norbert, to U.S. Philips Corporation. Device for transferring leadless components to a given mounting position on a circuit board. 4,476,626, Cl. 29-740.000.

Gunneman, Paul, to Ruti-te Strake B.V. Shuttleless weaving machine. 4,476,903, Cl. 139-435.000.

Guskov, Igor A.: *See*—
Kanshin, Nikolai N.; Guskov, Igor A.; Konoplev, Alexei A.; Sachkov, Alexandr E.; and Matt, Matvei M., 4,476,863, Cl. 128-305.000.

Gutierrez, William A.; and Wilson, Herbert L., to United States of America, Army. Method of forming GaAs on $Al_yGa_{1-y}As$ transmission mode photocathodehode. 4,477,294, Cl. 148-171.000.

Gutterman, Jeffrey S., to General Motors Corporation. Combined vibration and temperature sensor. 4,476,711, Cl. 73-35.000.

Guyonnet, Marcel A. R.: *See*—
Georgel, Gaston P. V.; and Guyonnet, Marcel A. R., 4,477,241, Cl. 425-85.000.
Guzder, Shapoor B.: *See*—
Smeltzer, Paul; Shah, Mahesh N.; and Guzder, Shapoor B., 4,477,062, Cl. 267-64.280.
H. B. Fuller: *See*—
Juba, Bernard T.; and Giessen, Michael J. V., 4,476,657, Cl. 52-139.000.
H & S Machine & Supply Co., Inc.: *See*—
Hipkins, Edward C., Jr.; and Locotos, Frank M., 4,477,209, Cl. 405-261.000.
H. W. Hart Mfg. Co.: *See*—
Dube, Maurice T.; Hart, Michael W.; and Hart, Warren H., 4,476,812, Cl. 119-75.000.
Haaf, William R.; Lee, Gim F., Jr.; and Cooper, Glenn D., deceased (by Cooper, Rose H., executrix), to General Electric Company. Gel impact modified polycarbonate resin compositions. 4,477,627, Cl. 525-67.000.
Hadden, David M.; and Micko, Eric S., to Delphian Partners. Remote calibration system. 4,476,706, Cl. 73-1.00G.
Hadley, Chris L.: *See*—
Roch, Gerald V.; Wiles, James P.; and Hadley, Chris L., 4,477,754, Cl. 318-568.000.
Haeger, Bruce E., to American Cyanamid Company. Composition of matter comprising a lyophilized preparation of a penicillin derivative. 4,477,452, Cl. 424-250.000.
Hafez, Mahmoud M., to Exxon Research and Engineering Co. Dewaxing by a combination centrifuge/catalytic process including solvent deoiling. 4,477,333, Cl. 208-30.000.
Hafner, Udo: *See*—
Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, 4,477,027, Cl. 239-585.000.
Haga, Shozi; and Nozaki, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Gear-shift mechanism for power transmission units. 4,476,738, Cl. 74-475.000.
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Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, 4,476,739, Cl. 74-475.000.
Hage, Manfred; and Schinkoth, Gerhard, to Wieland-Werke AG. Method for producing finned tubes. 4,476,704, Cl. 72-276.000.
Hagemann, Hans J.; Hunten, Siegfried; Wernicke, Rolf; Klomp, Cornelius J.; and Noorlander, Willem, to U.S. Philips Corporation. Method of manufacturing a dielectric. 4,477,401, Cl. 264-61.000.
Haggenmiller, Christian: *See*—
Lubniewski, Stephen E.; and Haggenmiller, Christian, 4,476,806, Cl. 118-110.000.
Hahn, Erwin: *See*—
Mayer, Udo; Hahn, Erwin; and Jesse, Joachim, 4,477,381, Cl. 260-392.000.
Haiges, Adolf, to Suevia Haiges GmbH & Co. Automatic livestock watering trough. 4,476,813, Cl. 119-75.000.
Hainzlmaier, Hermann: *See*—
Hentzschel, Hanspeter; and Hainzlmaier, Hermann, 4,476,765, Cl. 84-1.030.
Hajime Industries Ltd.: *See*—
Yoshida, Hajime, 4,476,981, Cl. 209-566.000.
Halbach & Braun Maschinenfabrik GmbH & Co.: *See*—
Braun, Gert; Braun, Ernst; and Herwig, Walthorst, 4,477,119, Cl. 299-34.000.
Hall, David A., to Eli Lilly and Company. 7-(S)-Acylaminocephalosporin sulfones and process. 4,477,660, Cl. 544-28.000.
Hall, Howard R., Jr. Japanese beetle trap. 4,476,647, Cl. 43-122.000.
Hall, John L., to PLC Peters Limited. Control mechanism for pneumatic apparatus. 4,476,678, Cl. 60-404.000.
Hall, Robert B.: *See*—
Barnett, Allen M.; Catalano, Anthony W.; Dalal, Vikram L.; Masi, James V.; Meakin, John D.; and Hall, Robert B., 4,477,688, Cl. 136-258.000.
Halliburton Company: *See*—
Almond, Stephen W., 4,477,360, Cl. 252-8.55R.
Ayers, William M.; Maheshwary, Ashok K.; and Young, Peter J., 4,477,348, Cl. 210-242.300.
Hamada, Mitsuru; Kumai, Toshio; and Ishida, Shoji, to Fujitsu Limited. Magnetic recording media having lubricated contact layer. 4,477,520, Cl. 428-336.000.
Hamberger, Helmut; and Fliri, Hans, to Sandoz Ltd. Cephalosporin derivatives and use as antimicrobial agents. 4,477,448, Cl. 424-246.000.
Hamisch, Paul H., Jr.; and Mistyurik, John D., to Monarch Marking Systems, Inc. Labeler. 4,477,305, Cl. 156-384.000.
Hamm, Steven J.: *See*—
Van De Motter, Charles P.; Hamm, Steven J.; and Van De Motter, Christopher C., 4,477,216, Cl. 409-257.000.
Hammerschmidt, Winrich B.: *See*—
Seidel, Hartmut; and Hammerschmidt, Winrich B., 4,476,600, Cl. 12-142.00V.
Hanafin, Joseph W.: *See*—
Doorakian, George A.; and Hanafin, Joseph W., 4,477,645, Cl. 528-99.000.
Handte, Reinhard: *See*—
Willms, Lothar; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,477,276, Cl. 71-94.000.
Haneda, Satoshi; Tomoso, Makoto; and Itaya, Masahiko, to Konishiroku Photo Industry Co., Ltd. Developing device. 4,477,174, Cl. 355-3.0DD.
Hanig, Richard E., to Garnicki, Ronia. Method for producing artistic designs on thin layer chromatography plates and product. 4,477,511, Cl. 428-201.000.
Hansen, James E.: *See*—
Evans, James M.; Krajca, Kenneth E.; Ukkonen, Keijo A.; and Hansen, James E., 4,477,613, Cl. 524-77.000.
Hanshaw, Richard D., to Dresser Industries, Inc. Hydraulic supply circuit for vehicle steering system. 4,476,677, Cl. 60-328.000.
Hara, Kunihiko: *See*—
Muramatsu, Hiromochi; Watanabe, Atsushi; and Hara, Kunihiko, 4,477,485, Cl. 427-38.000.
Hara, Shigeo: *See*—
Usami, Susumu; Teranishi, Nobuyuki; Kuwako, Tomohisa; Sugiyama, Ikuo; Tsujiuchi, Yoshio; and Hara, Shigeo, 4,477,150, Cl. 350-289.000.
Harasta, Louis P.; Leszyk, Gerald M.; and Morrison, Edward D., to Eastman Kodak Company. Radiation-curable overcoat compositions and toner-imaged elements containing same. 4,477,548, Cl. 430-14.000.
Hardesty, Edwin C., to AT&T Technologies, Inc. Tricoupler for modular wiring systems. 4,477,141, Cl. 339-122.00R.
Hardie, W. Richard, to Cutter Laboratories, Inc. Oral immune globulin. 4,477,432, Cl. 424-85.000.
Hardinge Brothers, Inc.: *See*—
Atkinson, Joseph W., III, 4,477,095, Cl. 279-1.00A.
Hardison, Robert P.: *See*—
Crain, Norman R.; and Hardison, Robert P., 4,477,718, Cl. 219-388.000.
Hardt, Zbigniew R.: *See*—
Lattimer, Mary B.; Weber, Carl D.; and Hardt, Zbigniew R., 4,477,619, Cl. 524-171.000.
Harmer, Alan L., to Battelle Memorial Institute. Photoelectric control device. 4,477,724, Cl. 250-227.000.
Harris Corporation: *See*—
Casper, Paul W.; Toy, James W.; Orlando, Fred J., Jr.; and Giri, Ronald R., 4,477,895, Cl. 370-16.000.
Harris Graphics Corporation: *See*—
Wise, James C., 4,477,067, Cl. 270-55.000.
Harris, Gregory C.: *See*—
Hurn, Richard L.; Harris, Gregory C.; and Cox, Herman P., 4,476,602, Cl. 15-28.000.
Harshaw/Filtrol Partnership: *See*—
Scherzer, Julius, 4,477,336, Cl. 208-120.000.
Hart, George V. Method of determining length of a conduit having ends at different elevations. 4,476,635, Cl. 33-228.000.
Hart, John R.: *See*—
Rohde, Clarence J.; and Farley, Donald J., 4,477,204, Cl. 405-153.000.
Hart, Michael W.: *See*—
Dube, Maurice T.; Hart, Michael W.; and Hart, Warren H., 4,476,812, Cl. 119-75.000.
Hart, Warren H.: *See*—
Dube, Maurice T.; Hart, Michael W.; and Hart, Warren H., 4,476,812, Cl. 119-75.000.
Harting, Juergen: *See*—
Jonas, Rochus; Kloft, Michael; Wurziger, Hanns; Harting, Juergen; Enenkel, Hans J.; Minck, Klaus-Otto; and Schliep, Hans-Jochen, 4,477,454, Cl. 424-250.000.
Hartley, Doug: *See*—
Saul, Ben; and Hartley, Doug, 4,477,798, Cl. 340-527.000.
Harvill, John I. Hot chamber die casting machine. 4,476,912, Cl. 164-316.000.
Hasbrouck, Gene B., to Hon Industries Inc. Partition system storage unit supports. 4,477,128, Cl. 312-111.000.
Hasebe, Tsutomu; and Takahashi, Teigo, to Tezuka Kosan Kabushiki Kaisha. Compression bundling apparatus. 4,476,779, Cl. 100-7.000.
Hasegawa, Shumpei; and Umesaki, Shigeo, to Honda Giken Kogyo Kabushiki Kaisha. Fuel injection control method for a multi-cylinder internal combustion engine, having a fail safe function for abnormality in cylinder-discriminating means. 4,476,830, Cl. 123-479.000.
Hashimoto, Norikazu: *See*—
Takanashi, Akihiro; Hashimoto, Norikazu; Maejima, Hisashi; and Sugiyama, Shuji, 4,477,182, Cl. 355-43.000.
Hattori, Tadashi; Ozaki, Tadashi; Miura, Kazuhiko; and Ootsuka, Yoshinori, to Nippon Soken, Inc. Knock detecting apparatus for internal combusion engines. 4,476,709, Cl. 73-35.000.
Havens, James R.: *See*—
Cleveland, Dixon; Havens, James R.; Nagel, Gregory L.; Decina, Basil A., Jr.; and Jenuwine, William C., 4,477,709, Cl. 219-109.000.
Hawk, Marion N.; and Lewis, James P. Method of materials testing. 4,476,727, Cl. 73-847.000.
Hawkins, Richard T.: *See*—
Izatt, Reed M.; Christensen, James J.; and Hawkins, Richard T., 4,477,377, Cl. 252-631.000.
Hawley, Gil R., to Phillips Petroleum Company. Polyolefin polymerization process and catalyst. 4,477,588, Cl. 502-119.000.
Hayashi, Yuzo: *See*—
Yamanashi, Fumiaki; Hayashi, Yuzo; Kano, Mitsuru; Fujiwara, Yoshiyuki; and Tashiro, Yoshizo, 4,477,368, Cl. 252-299.100.
Hayashida, Yoshihiro, to Tokico Ltd. Hydraulic pressure control valve for automobile braking system. 4,477,122, Cl. 303-6.00C.

Hayes, A. K. Bobo. Non-rigid motorcycle sidecar chassis with rigid lock device. 4,477,097, Cl. 280-203.000.

Hayes, Gerald E.: *See*—
Advani, Hira; Cason, William C.; and Hayes, Gerald E., 4,477,880, Cl. 364-900.000.

Haynes, Henry T. Control valve and switch assembly. 4,476,889, Cl. 137-116.300.

Hazardous Waste Management, Inc.: *See*—
Sittenfield, Marcus, 4,477,357, Cl. 210-748.000.

Healy, George M.; Sun, Anthony M.; and Macmorine, Hilda G., to Connaught Laboratories Limited. Continuous bovine beta cell line. 4,477,567, Cl. 435-71.000.

Heaney, James J., to Anthony's Manufacturing Company, Inc. Display type refrigerator/freezer cabinet. 4,477,129, Cl. 312-116.000.

Hearn, David D., to Atlantic Richfield Company. Drainhold drilling. 4,476,945, Cl. 175-203.000.

Heckler, Jay W., to Upjohn Company, The. Treatment of type II herpes virus with flurbiprofen. 4,477,468, Cl. 424-317.000.

Hedges, Charles V.: *See*—
Mark, Victor; and Hedges, Charles V., 4,477,647, Cl. 528-176.000.

Hedin, Jan Erik, to OSA AB. Device at automatic marking of continuously advanced tree stems. 4,476,755, Cl. 83-364.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Cyanate-containing polymers. 4,477,629, Cl. 525-113.000.

Hegemann, Gunther; and Miedeck, Karin, to BASF Farben & Fasern AG. Unsaturated homo- and/or copolymerizable polyesters. 4,477,653, Cl. 528-289.000.

Heilig, Glenn M., Jr.; and Gamewell, Joseph M. Forced bilateral thermosiphon loop. 4,476,922, Cl. 165-104.250.

Heilweil, Emanuel: *See*—
Virgilio, Joseph A.; and Heilweil, Emanuel, 4,477,683, Cl. 568-379.000.

Heimbach, Heinrich: *See*—
Knoblauch, Karl; and Heimbach, Heinrich, 4,477,052, Cl. 251-57.000.

Heintges, Siegfried; Strauss, Werner; and Horn, Hannes S., to Klockner-Humboldt-Deutz AG. Pressure/belt filter, particularly for dewatering fine coal. 4,477,358, Cl. 210-783.000.

Hellmann, Karl, to Ruhrkohle Aktiengesellschaft. Method and apparatus for processing high-ash coal slurries by flotation, particularly for processing gas coal and open-burning coal which are difficult to float. 4,477,338, Cl. 209-5.000.

Helser, Jerry L., to Owens-Corning Fiberglas Corporation. Method for recycling greenware in the manufacture of hydrous calcium silicate insulation products. 4,477,397, Cl. 264-37.000.

Hemphill, Charles W., to Hemphill Industries, Inc. Digging tooth and holder assembly. 4,476,642, Cl. 37-142.00R.

Hemphill Industries, Inc.: *See*—
Hemphill, Charles W., 4,476,642, Cl. 37-142.00R.

Henin, Jean-Pierre: *See*—
Cosar, Paul; and Henin, Jean-Pierre, 4,477,251, Cl. 432-106.000.

Henkel Corporation: *See*—
O'Lenick, Anthony J., 4,477,372, Cl. 252-545.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Rossmann, Christian; and Riedel, Wolfgang, 4,477,286, Cl. 134-10.000.

Henmi, Shoichi; Imura, Junichi; and Moriya, Isao, to Alps Electric Co., Ltd. Rotary electric component. 4,477,795, Cl. 338-163.000.

Henry, Georges: *See*—
Giboulet, Andre ; Henry, Georges; and Kieffer, Jean, 4,477,691, Cl. 174-22.00C.

Henry, James W.; and Scroggin, Stanley R., to Eastman Kodak Company. Yarn monitoring process. 4,477,398, Cl. 264-40.100.

Hentzschel, Hanspeter; and Hainzlmaier, Hermann, to Eurosil Electronic GmbH. Electronic music signal generator. 4,476,765, Cl. 84-1.030.

Heraeus Quarzschmelze GmbH: *See*—
Schulke, Karl A., 4,477,112, Cl. 294-16.000.

Heras, Roberto F. Dog training device. 4,476,810, Cl. 119-29.000.

Hercules Incorporated: *See*—
Chi, Minn-Shong, 4,477,297, Cl. 149-109.600.
Michl, Michael J.; and English, Larry W., 4,477,408, Cl. 264-532.000.

Herdeman, James R., to Honeywell Inc. Temperature dependent duty cycler control system. 4,477,733, Cl. 307-35.000.

Hermann Hemscheidt Maschinenfabrik GmbH & Co.: *See*—
Krieger, Karl; and Kuschke, Gunther, 4,476,898, Cl. 137-624.140.

Herrin, Melvin B. See through file folder. 4,477,013, Cl. 229-1.50R.

Herriott, Leslie V., to Lowe & Fletcher Limited. Magnetic lock and key. 4,476,701, Cl. 70-276.000.

Herrmann, Walter J.: *See*—
Gorman, Gerald W.; and Herrmann, Walter J., 4,476,772, Cl. 92-168.000.

Herrmann, Wolfgang; Geibel, Wolfram; and Satzinger, Gerhard, to Warner-Lambert Company. Process for the preparation of 4-hydroxy-3-(heterocyclocarbamoyl)-2H-1,2-benzothiazine-1,1-dioxides. 4,477,661, Cl. 544-49.000.

Herschler, Robert J. Preparations containing methylsulfonylmethane and methods of use and purification. 4,477,469, Cl. 424-322.000.

Hershberger, Doran D., to General Electric Company. Transmission for a laundry machine. 4,476,736, Cl. 74-341.000.

Herve, Guy: *See*—
de Sivry, Bruno; Herve, Guy; Colas, Claude; and Caputi, Jean-Louis, 4,476,605, Cl. 15-179.000.

Herwig, Walthorst: *See*—
Braun, Gert; Braun, Ernst; and Herwig, Walthorst, 4,477,119, Cl. 299-34.000.

Herzberg, Roland: *See*—
Knips, Ulrich; Bohmer, Bertram; and Herzberg, Roland, 4,477,380, Cl. 260-385.000.

Hessbruggen, Norbert, to EMAG Maschinenfabrik GmbH. Machine tool with a separable transmission for its work spindle. 4,476,752, Cl. 82-28.00R.

Hetherington, Brian L.; Gray, Peter H.; and Mollison, Alistair N., to Du Pont de Nemours, E. I., and Company. Machine direction orientation of nylon film. 4,477,407, Cl. 264-288.400.

Hewlett-Packard Company: *See*—
Conrad, Richard J., 4,477,803, Cl. 340-722.000.
Nygaard, Richard A., Jr., 4,477,920, Cl. 377-52.000.
Wright, Allen J., 4,477,134, Cl. 339-17.00F.

Hickman, Fred E., III: *See*—
Thomas, Wilbur R.; Hickman, Fred E., III; and Knight, George J., 4,477,512, Cl. 428-236.000.

Higgs, Arthur B. Wheel chairs. 4,477,117, Cl. 297-45.000.

Higuchi, Seizun; Tano, Kazuhiro; Kamada, Minoru; and Okamoto, Susumu, to Nippon Steel Corporation. Apparatus for coating one side only of steel strip with molten coating metal. 4,476,805, Cl. 118-65.000.

Hikosaka, Kohki: *See*—
Mimura, Takashi; Hikosaka, Kohki; and Odani, Kouichiro, 4,477,311, Cl. 156-643.000.

Hilbrans, Hermann: *See*—
Esna-Ashari, Mohammed; and Hilbrans, Hermann, 4,477,323, Cl. 204-119.000.

Hilchey, Robert M.; and Fors, Arne L., to MTD Products Limited. Hand control system for motorized implements. 4,476,643, Cl. 37-245.000.

Hill, H. Wayne, Jr., to Phillips Petroleum Company. Condensation polymers of cyclic diols with aldehydes or acetals of aldehydes. 4,477,652, Cl. 528-232.000.

Hilton-Davis Chemical Co., The: *See*—
Crounse, Nathan N.; and Schmidt, Paul J., 4,477,676, Cl. 548-493.000.

Himmelwright, Richard S., to Polaroid Corporation. Method for preparing photosensitive silver halide emulsion. 4,477,565, Cl. 430-567.000.

Hindle, Edward D., to United Kingdom Atomic Energy Authority. Nuclear reactor fuel elements. 4,477,411, Cl. 376-412.000.

Hinshaw, John V., Jr.: *See*—
Yang, Frank J.; and Hinshaw, John V., Jr., 4,477,266, Cl. 55-67.000.

Hipkins, Edward C., Jr.; and Locotos, Frank M., to H & S Machine & Supply Co., Inc. Anchor bolt assembly. 4,477,209, Cl. 405-261.000.

Hippel, Hans: *See*—
Conrads, Hans; Hoffmans, Josef; Hippel, Hans; Hoven, Hubert; Rolaussf, Hans; and Schafer, Max, 4,476,793, Cl. 112-221.000.

Hiraga, Masaharu: *See*—
Yoshii, Yuji; and Hiraga, Masaharu, 4,477,239, Cl. 418-55.000.

Hiraiwa, Kazuyoshi, to Nissan Motor Company, Limited. Four-wheel vehicle drive system. 4,476,953, Cl. 180-249.000.

Hiramoto, Junichi; Takenaka, Shinya; and Sunago, Katsuyoshi, to Sumitomo Electric Industries, Ltd. Leakage current detecting structure. 4,477,768, Cl. 324-51.000.

Hirosuke Kojima: *See*—
Otsu, Takayuki; and Kojima, Hirosuke, 4,477,599, Cl. 521-89.000.

Hirsch, Win. Surgical sponge. 4,477,256, Cl. 604-362.000.

Hisaoka, Satoshi; Matsuzaka, Takashi; and Saito, Toshihiko, to Suzuye and Suzuye. Silencer unit. 4,477,246, Cl. 431-114.000.

Hitachi Construction Machinery Co., Ltd.: *See*—
Sato, Masayuki, 4,476,679, Cl. 60-434.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Koya, Masahiro; Maeda, Narimichi; Ishizuka, Kohei; Takaoka, Kazuhiko; Kokuryo, Yoshiro; and Kita, Yasuhiro, 4,477,913, Cl. 375-13.000.

Hitachi, Ltd.: *See*—
Kato, Takao; and Takemura, Tetsuo, 4,477,899, Cl. 370-94.000.
Kawamura, Yoshio; Takanashi, Akihiro; Kurosaki, Toshiei; Kuniyoshi, Shinji; Hosaka, Sumio; and Terasawa, Tsuneo, 4,477,183, Cl. 355-55.000.
Kobayashi, Nobuhisa; Mori, Kinji; Ihara, Hirokazu; and Ikeda, Katuaki, 4,477,881, Cl. 364-900.000.
Koya, Masahiro; Maeda, Narimichi; Ishizuka, Kohei; Takaoka, Kazuhiko; Kokuryo, Yoshiro; and Kita, Yasuhiro, 4,477,913, Cl. 375-13.000.
Kunugi, Yoshifumi, 4,476,694, Cl. 62-476.000.
Nakayama, Keizo; and Seo, Kazuo, 4,477,855, Cl. 361-54.000.
Onishi, Yoshiaki, 4,477,736, Cl. 307-297.000.
Otake, Katsumoto; Miyai, Masahiko; Sasaki, Takuya; Mukai, Yasuteru; Takahashi, Sankichi; and Okouchi, Isao, 4,476,917, Cl. 165-1.000.
Shiga, Masao; Kirihara, Seishin; Kuriyama, Mitsuo; Yoshioka, Takatoshi; and Sasaki, Ryoichi, 4,477,280, Cl. 75-124.000.
Suzuki, Satoshi; and Ando, Hiroyuki, 4,477,875, Cl. 364-431.080.
Takanashi, Akihiro; Hashimoto, Norikazu; Maejima, Hisashi; and Sugiyama, Shuji, 4,477,182, Cl. 355-43.000.

Hochreuther, Karl; and Tragatschnig, Jorg, to Metrawatt GmbH. Multi-purpose measuring device with a hinged display. 4,476,721, Cl. 73-431.000.

Hochtemperatur-Reaktorbau GmbH: *See*—
Schoening, Josef; Schwiers, Hans-Georg; and Mitterbacher, Paul, 4,477,409, Cl. 376-296.000.

Hoechst Aktiengesellschaft: *See*—
Neumann, Juergen, 4,477,181, Cl. 355-3.0SH.
Willms, Lothar; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,477,276, Cl. 71-94.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Effland, Richard C.; Davis, Larry; and Klein, Joseph T., 4,477,670, Cl. 546-141.000.
Martin, Lawrence L.; and Setescak, Linda L., 4,477,465, Cl. 424-275.000.

Hoffer, John C.: *See*—
Bowen, Terry P.; Caron, Bernard G.; Glover, Douglas W.; and Hoffer, John C., 4,477,146, Cl. 350-96.210.

Hoffman, Dietrich; and Gotz, Udo, to Mauser-Werke Oberndorf GmbH. Sabot projectile. 4,476,785, Cl. 102-522.000.

Hoffman, Paul L.; and Manente, Joseph C., Jr., to Avco Corporation. Honeycomb seal for turbine engines. 4,477,089, Cl. 277-153.000.

Hoffmans, Josef: *See*—
Conrads, Hans; Hoffmans, Josef; Hippel, Hans; Hoven, Hubert; Rolaussf, Hans; and Schafer, Max, 4,476,793, Cl. 112-221.000.

Hokse, Hendrik; Kaper, Frederik S.; and Wijpkema, Jacob T., to Proefstation voor Aardappelverwerking-TNO en Cooperatieve Verkoopen Produktievereniging van Aardappelmeel en Derivaten AVERE B.A. Process for the manufacture of cyclodextrin. 4,477,568, Cl. 435-97.000.

Holl, Helmar, to Dorina Nahmaschinen GmbH. Needle clamp arrangement for a sewing machine. 4,476,794, Cl. 112-226.000.

Holland, Charles L.; and Jennings, Dale L., to Rohr Industries, Inc. Foil insert honeycomb sandwich brazing process and resulting structure. 4,477,012, Cl. 228-181.000.

Hollis, Craig E.; and Hollis, Glenn E. Fan filter. 4,477,272, Cl. 55-471.000.

Hollis, Glenn E.: *See*—
Hollis, Craig E.; and Hollis, Glenn E., 4,477,272, Cl. 55-471.000.

Hollister Incorporated: *See*—
Osburn, Frank G., 4,477,325, Cl. 204-159.120.

Holmes, Paul A.; Collins, Stephen H.; and Wright, Leonard F., to Imperial Chemical Industries PLC. 3-Hydroxybutyrate polymers. 4,477,654, Cl. 528-361.000.

Holmes, Paul A., to Imperial Chemical Industries PLC. Moulding of poly-hydroxybutyrate containing bacterial cell fragments. 4,477,655, Cl. 528-361.000.

Hon, Edward H., to American Home Products Corporation. Monitoring of cervical dilatation during labor. 4,476,871, Cl. 128-642.000.

Hon Industries Inc.: *See*—
Hasbrouck, Gene B., 4,477,128, Cl. 312-111.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Shumpei; and Umesaki, Shigeo, 4,476,830, Cl. 123-479.000.
Ikenoya, Yasuo; and Ishida, Yoichi, 4,476,676, Cl. 60-290.000.

Honda Motor Co., Ltd.: *See*—
Ito, Toshifumi, 4,476,951, Cl. 180-219.000.

Honeywell Inc.: *See*—
Herdeman, James R., 4,477,733, Cl. 307-35.000.

Honeywell Information Systems Inc.: *See*—
Bertolazzi, Ugo, 4,477,103, Cl. 283-62.000.

Honma, Akiyoshi: *See*—
Usui, Masaji; and Honma, Akiyoshi, 4,477,854, Cl. 361-36.000.

Honma, Toshio: *See*—
Furuichi, Katsushi; Yokomizo, Yoshikazu; Honma, Toshio; and Murakami, Katsumi, 4,477,178, Cl. 355-14.00R.

Hoodlebrink, Merlin P.: *See*—
Brandt, Robert H.; and Hoodlebrink, Merlin P., 4,477,350, Cl. 210-387.000.

Hoofe, William J., III. Clip locked roofing and siding panels. 4,476,661, Cl. 52-546.000.

Hope, George P.; and Rhodes, Randy D., to RCA Corporation. Lid latching apparatus. 4,476,994, Cl. 220-318.000.

Hopko, Donald J.: *See*—
Kotzur, Frank W.; Kotzur, Gregory A.; Meade, John F.; and Hopko, Donald J., 4,477,033, Cl. 242-18.00A.

Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, to Toyama Chemical Co., Ltd. Novel 1-(4-piperidiniobenzyl)-2,3-dioxopiperazine derivatives or acid addition salts thereof. 4,477,664, Cl. 544-360.000.

Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, to Toyama Chemical Co., Ltd. 1-(4-Aminobenzyl)-2,3-dioxopiperazine derivatives, acid addition salts thereof and process for producing same. 4,477,666, Cl. 544-385.000.

Hori, Takako: *See*—
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,477,437, Cl. 424-116.000.

Horie, Seiji; Nagata, Masayoshi; Nakano, Junji; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Electrophotographic photoreceptor with hydrazone. 4,477,550, Cl. 430-59.000.

Horiuchi, Ichiro: *See*—
Ida, Shuichiro; Ooshima, Shoichi; Horiuchi, Ichiro; and Nishu, Mitsufumi, 4,476,740, Cl. 74-476.000.

Horn, Hannes S.: *See*—
Heintges, Siegfried; Strauss, Werner; and Horn, Hannes S., 4,477,358, Cl. 210-783.000.

Hosaka, Sumio: *See*—
Kawamura, Yoshio; Takanashi, Akihiro; Kurosaki, Toshiei; Kuniyoshi, Shinji; Hosaka, Sumio; and Terasawa, Tsuneo, 4,477,183, Cl. 355-55.000.

Hosoe, Kazuya, to Canon Kabushiki Kaisha. Range finder. 4,477,168, Cl. 354-403.000.

Hosoya, Nobukazu, to Sanyo Electric Co., Ltd. Color gain control circuit. 4,477,831, Cl. 358-27.000.

Hoven, Hubert: *See*—
Conrads, Hans; Hoffmans, Josef; Hippel, Hans; Hoven, Hubert; Rolaussf, Hans; and Schafer, Max, 4,476,793, Cl. 112-221.000.

Hoyer, Elmer A.: *See*—
Avery, James M.; and Hoyer, Elmer A., 4,477,925, Cl. 381-43.000.

Huang, Chi-Hao. Feeder connector assembly for coaxial cable. 4,477,144, Cl. 339-177.00R.

Huang, Jen-Chi: *See*—
Chu, Simon L.; Golda, Eugene; Huang, Jen-Chi; and Wilkes, Alan, 4,477,317, Cl. 204-33.000.

Huber, Peter; Wimmer, Franz; Innertsberger, Ernst; and Schmidlkofer, Jakob, to Wacker-Chemie GmbH. Aqueous dispersible defoamers. 4,477,371, Cl. 252-358.000.

Hughes, Clarence J., Jr.: *See*—
Beimesch, Bruce J.; Schnur, Nicholas E.; and Hughes, Clarence J., Jr., 4,477,383, Cl. 260-410.600.

Hughes, David W.: *See*—
Sutton, Tonja R.; and Hughes, David W., 4,477,644, Cl. 528-73.000.

Hughes, John H. Comminuter with coacting discharge screening device. 4,477,028, Cl. 241-69.000.

Hughes, Ronald M.: *See*—
Palmer, Christopher W.; and Hughes, Ronald M., 4,476,963, Cl. 188-79.50B.

Hughes Tool Company: *See*—
Boles, Joel L.; and Mancillas, Gene, 4,476,931, Cl. 166-294.000.
Knox, Dick L.; and Roberts, Steven D., 4,477,230, Cl. 417-63.000.
Regan, Albert M., 4,476,934, Cl. 166-368.000.
Wittman, Robert H.; Adkins, David E.; and Chin, Arthur H. T., 4,477,105, Cl. 285-18.000.

Hultman, Rolf O., to Miliokonsult Rolf Hultman AB. Method of protecting bushes, trees and like plants against attack by pathogenic fungi; a fungicide for carrying out the method; and a method of producing the fungicide. 4,477,433, Cl. 424-93.000.

Hunten, Siegfried: *See*—
Hagemann, Hans J.; Hunten, Siegfried; Wernicke, Rolf; Klomp, Cornelius J.; and Noorlander, Willem, 4,477,401, Cl. 264-61.000.

Hunter, Dianne M.: *See*—
Deutsch, Alice; Brandwein, Harvey; Platt, Herbert; Hunter, Dianne M.; Dubitsky, Andrew; and Durham, Susan M., 4,477,576, Cl. 436-500.000.

Hurco Mfg. Co. Inc.: *See*—
Roch, Gerald V.; Wiles, James P.; and Hadley, Chris L., 4,477,754, Cl. 318-568.000.

Hurn, Richard L.; Harris, Gregory C.; and Cox, Herman P., to Black & Decker, Inc. Portable electric scrubber. 4,476,602, Cl. 15-28.000.

Husky Oil Operations Ltd.: *See*—
Ronden, Clifford P.; and Boylance, Donald C., 4,477,337, Cl. 208-188.000.

Hust, Gary A.: *See*—
Kush, Donald C.; and Hust, Gary A., 4,477,287, Cl. 134-15.000.

Hutchison, S. O., to Chevron Research Company. Concentric insulated tubing string. 4,477,106, Cl. 285-47.000.

Hydril Company: *See*—
Hynes, Joseph H.; and Morrill, Charles D., 4,476,935, Cl. 166-373.000.

Hynes, Joseph H.; and Morrill, Charles D., to Hydril Company. Safety valve apparatus and method. 4,476,935, Cl. 166-373.000.

Iannelli, Frank M. Dual temperature refrigeration system. 4,476,690, Cl. 62-198.000.

Ichihashi, Hiroo: *See*—
Matsufuji, Yohji; Togano, Shigeo; and Ichihashi, Hiroo, 4,477,823, Cl. 346-140.00R.

Ichijima, Seiji; Sakanoue, Kei; Kobayashi, Hidetoshi; and Adachi, Keiichi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,477,563, Cl. 430-544.000.

Ichikawa, Yoshio, to Nippon Electric Co., Ltd. Radio paging receiver having stored message protection means. 4,477,808, Cl. 340-825.440.

ICI Americas Inc.: *See*—
Robertson, John R., 4,477,366, Cl. 252-182.000.

Ida, Shuichiro; Ooshima, Shoichi; Horiuchi, Ichiro; and Nishu, Mitsufumi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Shift mechanism for change-speed gear transmission. 4,476,740, Cl. 74-476.000.

Igura, Toshinori: *See*—
Suzuki, Yoshitsugu; Iizuka, Shogo; Kajiyama, Shigeo; Usui, Kenji; Kobayashi, Masahiro; Igura, Toshinori; Kudo, Shigezi; and Suzuki, Sanae, 4,476,629, Cl. 29-863.000.

Ihara, Akira: *See*—
Mizuno, Katsuyoshi; and Ihara, Akira, 4,477,159, Cl. 351-221.000.

Ihara, Hirokazu: *See*—
Kobayashi, Nobuhisa; Mori, Kinji; Ihara, Hirokazu; and Ikeda, Katuaki, 4,477,881, Cl. 364-900.000.

Iijima, Toshifumi: *See*—
Koitabashi, Takeo; Yamashita, Kiyoshi; and Iijima, Toshifumi, 4,477,560, Cl. 430-506.000.

IIT Research Institute: *See*—
Bridges, Jack E.; and Taflove, Allen, 4,476,926, Cl. 166-248.000.

Iizuka, Shogo: *See*—
Suzuki, Yoshitsugu; Iizuka, Shogo; Kajiyama, Shigeo; Usui, Kenji; Kobayashi, Masahiro; Igura, Toshinori; Kudo, Shigezi; and Suzuki, Sanae, 4,476,629, Cl. 29-863.000.
Ikeda, Katuaki: *See*—
Kobayashi, Nobuhisa; Mori, Kinji; Ihara, Hirokazu; and Ikeda, Katuaki, 4,477,881, Cl. 364-900.000.
Ikeda, Minoru, to France Bed Co., Ltd. Mattress for use on a bed and settee. 4,476,595, Cl. 5-478.000.
Ikegami, Mikihiko: *See*—
Sato, Susumu; Onda, Masaru; and Ikegami, Mikihiko, 4,477,621, Cl. 524-496.000.
Ikemori, Keiji: *See*—
Suda, Shigeyuki; and Ikemori, Keiji, 4,477,153, Cl. 350-426.000.
Ikenoya, Yasuo; and Ishida, Yoichi, to Honda Giken Kogyo Kabushiki Kaisha. Secondary air supply control device for exhaust gas purifying apparatus of internal combustion engines. 4,476,676, Cl. 60-290.000.
Ikuta, Hiroshi; and Kato, Takaaki, to Nippondenso Co., Ltd. Card-operated control system for vehicle components. 4,477,874, Cl. 364-424.000.
Illinois Tool Works Inc.: *See*—
Cearlock, Steven V.; Peterson, Francis C.; and Kunos, Gene S., 4,477,307, Cl. 156-580.000.
Loudin, Philip B., 4,476,609, Cl. 17-1.00R.
Imamura, Kazuyoshi: *See*—
Muroi, Soichi; Seta, Shigetoshi; Matsumoto, Yoshio; Yasui, Koichi; and Imamura, Kazuyoshi, 4,477,636, Cl. 525-444.000.
Imamura, Nobutake: *See*—
Ota, Chuichi; Imamura, Nobutake; and Tanaka, Shinsuke, 4,477,852, Cl. 360-114.000.
Imatani, Tsuneo: *See*—
Kojima, Shunji; Katsura, Tadahiko; Ueno, Hiroshi; Taira, Kazuo; and Imatani, Tsuneo, 4,477,501, Cl. 428-35.000.
Imperial Chemical Industries PLC: *See*—
Holmes, Paul A.; Collins, Stephen H.; and Wright, Leonard F., 4,477,654, Cl. 528-361.000.
Holmes, Paul A., 4,477,655, Cl. 528-361.000.
Imperial Underground Sprinkler Co.: *See*—
Lockwood, James F., 4,477,026, Cl. 239-428.500.
Imura, Junichi: *See*—
Henmi, Shoichi; Imura, Junichi; and Moriya, Isao, 4,477,795, Cl. 338-163.000.
INA Walzlager Schaeffler KG: *See*—
Zorn, Helmut; Spiess, Karl; and Bina, Wenzel, 4,477,714, Cl. 219-149.000.
Ingels, Luis: *See*—
White, Larry W.; and Ingels, Luis, 4,476,604, Cl. 15-105.000.
Inmont Corporation: *See*—
Aluotto, Patrick F.; Drees, Paul A.; and Soucek, Charles A., 4,477,609, Cl. 523-407.000.
Innertsberger, Ernst: *See*—
Huber, Peter; Wimmer, Franz; Innertsberger, Ernst; and Schmidlkofer, Jakob, 4,477,371, Cl. 252-358.000.
Institut Kosmicheskikh Issledovany Akademii Nauk SSSR: *See*—
Ziman, Yan L.; Kottsov, Vladimir A.; Chesnokov, Jury M.; Dunaev, Boris S.; Drokhanov, Alexei N.; Kraush, Klavdia A.; and Barabanov, Stanislav D., 4,477,829, Cl. 358-1.000.
Institut National de la Sante et de la Recherche Medicale (INSERM): *See*—
Courtois, Yves; Barritault, Denis; and Pouliquen, Yves, 4,477,435, Cl. 424-95.000.
Institutul De Cercetare Stiintifica Si Inginerie Technologica Pentru Industria Electrotehnica: *See*—
Apetrei, Constantin; Nitigus, Victor; Demeter, Elek; Radulescu, Marian; and Sachelarie, Toma, 4,477,743, Cl. 310-77.000.
Instytut Mechaniki Precyzyjnej: *See*—
Olazewski, Witold; Lis, Andrzej; Pietraszek, Pawel; and Tuznik, Franciszek S., 4,477,344, Cl. 210-109.000.
Interletter AG: *See*—
Czichy, Eleonore, 4,477,312, Cl. 156-656.000.
Intermedics, Inc.: *See*—
Bihn, Daniel, 4,476,869, Cl. 128-419.0PT.
International Business Machines Corporation: *See*—
Advani, Hira; Cason, William C.; and Hayes, Gerald E., 4,477,880, Cl. 364-900.000.
Arter, Nelson K.; Estabrooks, Dennis C.; and Jackson, William G., 4,477,068, Cl. 271-186.000.
Banks, Thomas M.; Ruckel, Raymond R.; Spencer, Samuel F.; and Walker, John Q., 4,476,734, Cl. 73-864.160.
Bowlds, Patsy A.; Dunn, David P.; Fathergill, Rex D.; Findlay, Hugh T.; and Stafford, Donald W., 4,477,198, Cl. 400-120.000.
Bustamante, Louis A., 4,477,180, Cl. 355-14.00R.
Chang, Tai-Hon P.; and Wilson, Alan D., 4,477,729, Cl. 250-492.200.
Chappell, Terry I.; Pohl, Dieter W.; and Woodall, Jerry M., 4,477,721, Cl. 250-211.00J.
Cholat-Namy, Jean, 4,477,898, Cl. 370-80.000.
Collins, David W.; Neesz, John J.; and Stich, Michael C., 4,477,750, Cl. 318-270.000.
Cottrell, Peter E.; Gersbach, John E.; and Pricer, Wilbur D., 4,477,846, Cl. 360-46.000.
El-Kareh, Badih, 4,476,623, Cl. 29-576.00W.
Kouba, Daniel J., 4,477,738, Cl. 307-445.000.
Lee, Michael H.; Onton, Aare; and Wieder, Harold, 4,477,819, Cl. 346-76.00L.
Linger, Claude J. A.; and Locicero, Gisele C., 4,477,926, Cl. 382-8.000.
Losq, Jacques J.; Rao, Gururaj S.; and Sachar, Howard E., 4,477,872, Cl. 364-200.000.
Moser, John J., Jr., 4,477,741, Cl. 307-473.000.
Paoletti, Frank; and Schubert, Steven A., 4,477,484, Cl. 427-10.000.
Puri, Prem; and Puri, Yogi K., 4,477,902, Cl. 371-25.000.
Westermann, Karl H., 4,477,304, Cl. 156-250.000.
International Harvester Co.: *See*—
Robinson, Edward L., Jr.; and Gesior, Augustyn M., 4,477,801, Cl. 340-684.000.
International Paper Company: *See*—
Ring, Michael; and Kirk, William K., 4,477,495, Cl. 427-356.000.
International Standard Electric Corporation: *See*—
Arton, Kenneth A. M.; and Rokos, George H. S., 4,477,805, Cl. 340-784.000.
Murray, James A.; and Nyman, David, 4,477,914, Cl. 375-14.000.
International Telephone & Telegraph Corporation: *See*—
Cho, Ching F., 4,477,816, Cl. 343-786.000.
Espiritu, Hermenegildo A., 4,477,140, Cl. 339-89.00M.
McCarley, Edgar L., 4,477,873, Cl. 364-200.000.
Intervisual Communications Inc.: *See*—
Lokvig, Tor, 4,476,650, Cl. 446-362.000.
Inui, Toshiharu: *See*—
Moriguchi, Haruhiko; and Inui, Toshiharu, 4,477,820, Cl. 346-76.0PH.
Inuzuka, Tsuneki; Ishida, Masato; and Kawatsura, Yoshihiro, to Canon Kabushiki Kaisha. Image forming apparatus with adjustable light source. 4,477,179, Cl. 355-14.00E.
Inventor's Technology Corporation: *See*—
Zaccaria, Gary S., 4,476,639, Cl. 36-114.000.
Iowa Manufacturing Company: *See*—
Alford, Peter B., 4,477,031, Cl. 241-211.000.
Ishida, Masato: *See*—
Inuzuka, Tsuneki; Ishida, Masato; and Kawatsura, Yoshihiro, 4,477,179, Cl. 355-14.00E.
Ishida, Shoji: *See*—
Hamada, Mitsuru; Kumai, Toshio; and Ishida, Shoji, 4,477,520, Cl. 428-336.000.
Ishida, Yoichi: *See*—
Ikenoya, Yasuo; and Ishida, Yoichi, 4,476,676, Cl. 60-290.000.
Ishii, Hiroshi, to Casio Computer Co., Ltd. Electronic musical instrument with means for generating accompaniment and melody sounds with different tone colors. 4,476,766, Cl. 84-1.030.
Ishikawa, Norio; and Miki, Yukio, to Minolta Camera Kabushiki Kaisha. Protective device for automatic focusing camera. 4,477,167, Cl. 354-400.000.
Ishimura, Hidekazu; Kakutani, Yoshimi; and Aoyagi, Naohisa, to Asahi Kasei Kogyo Kabushiki Kaisha. Aqueous dispersion compositions. 4,477,610, Cl. 523-414.000.
Ishizuka, Kohei: *See*—
Koya, Masahiro; Maeda, Narimichi; Ishizuka, Kohei; Takaoka, Kazuhiko; Kokuryo, Yoshiro; and Kita, Yasuhiro, 4,477,913, Cl. 375-13.000.
Ismail, Raouf A.; and Mead, Jonathan T., to Cambridge Aero Instruments, Inc. Unidirectional fluidflow sensor system. 4,476,720, Cl. 73-202.000.
Isobe, Toshiaki: *See*—
Shinoda, Kazuo; and Isobe, Toshiaki, 4,476,831, Cl. 123-480.000.
Isogai, Jun; Nakaya, Seiichi; Saitou, Akira; Takahashi, Akio; and Yagi, Isao, to Denki Kagaku Kogyo Kabushiki Kaisha. Demolition agent for demolishing brittle materials. 4,477,284, Cl. 106-104.000.
Itaya, Masahiko: *See*—
Haneda, Satoshi; Tomono, Makoto; and Itaya, Masahiko, 4,477,174, Cl. 355-3.0DD.
Ito, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Speed change control apparatus and method for automatic transmission. 4,476,970, Cl. 192-0.052.
Ito, Hiroshi: *See*—
Kobayashi, Nobuyuki; and Ito, Hiroshi, 4,476,828, Cl. 123-339.000.
Ito, Jiro, to Kabushiki Kaisha Suwa Seikosha. Analog electronic timepiece. 4,477,196, Cl. 368-157.000.
Ito, Nobuaki: *See*—
Akimoto, Ryosaku; Yoshida, Yukio; and Ito, Nobuaki, 4,476,919, Cl. 165-28.000.
Ito, Tetsuo; and Oda, Shingo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Device for measuring the length of a weft. 4,476,904, Cl. 139-452.000.
Ito, Toshifumi, to Honda Motor Co., Ltd. Engine for motorcycles. 4,476,951, Cl. 180-219.000.
Itoh, Takaaki: *See*—
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,477,392, Cl. 261-39.00A.
Itoh, Takeo: *See*—
Karasawa, Kohichi; Itoh, Takeo; Koizumi, Humihito; and Uchida, Kimio, 4,477,045, Cl. 248-1.000.
Itoi, Toru. Convertible garment. 4,476,587, Cl. 2-94.000.
ITT Industries, Inc.: *See*—
Belart, Juan; Kircher, Dieter; Budecker, Ludwig; and Obersteiner, Georg, 4,477,125, Cl. 303-116.000.
Gollinger, Wolfgang; and Mlynek, Daniel, 4,477,735, Cl. 307-270.000.
Mash, Derek H., 4,477,151, Cl. 350-351.000.
Ivanov, Jury P.; Averbukh, Anatoly B.; Evstafiev, Evgeny A.; and Tarasov, Alexandr E. Apparatus for assembling a ship hull module. 4,476,797, Cl. 114-65.00R.

Iwahashi, Hiroshi; and Asano, Masamichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory with improved data programming time. 4,477,884, Cl. 365-189.000.

Iwamoto, Hidenori: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; Iwamoto, Hidenori; and Sakamoto, Shuichi, 4,477,443, Cl. 424-180.000.

Iwamuro, Masao; and Kumashiro, Kenji, to Konishiroku Photo Industry Co., Ltd. Photosensitive silver halide color photographic materials. 4,477,559, Cl. 430-505.000.

Iwasyk, John M; and Sauerbrunn, Robert D., to Du Pont de Nemours, E. I., and Company. Modified nozzles for polymer finishers. 4,477,271, Cl. 55-416.000.

Izatt, Reed M.; Christensen, James J.; and Hawkins, Richard T., to Brigham Young University. Recovery of cesium. 4,477,377, Cl. 252-631.000.

J. F. Adolff AG: *See*—
Friedrich, Hans-Joachim, 4,477,299, Cl. 156-72.000.

J. M. Voith GmbH: *See*—
Schweiss, Peter; and Dorflinger, Hans-Dieter, 4,477,341, Cl. 209-170.000.

Jackson, Allan R.: *See*—
Asawa, Charles K.; Austin, Joseph W.; Barnoski, Michael K.; Jackson, Allan R.; Personick, Stewart D.; and Yao, Shi-Kay, 4,477,725, Cl. 250-231.00R.

Jackson, Andre J. Apparatus for and methods of collecting urine from laboratory animals. 4,476,879, Cl. 128-760.000.

Jackson, William G.: *See*—
Arter, Nelson K.; Estabrooks, Dennis C.; and Jackson, William G., 4,477,068, Cl. 271-186.000.

Jackson, William M.: *See*—
Cannon, Joseph N.; De Lucia, David E.; Jackson, William M.; and Porter, James H., 4,476,816, Cl. 122-4.00D.

Jacobs, Edward C.: *See*—
Kubacki, Edward F.; Jacobs, Edward C.; Masciale, John M.; and Monroe, James R., 4,476,781, Cl. 101-3.00R.

Jamon, Jacques, to Compagnie Generale des Etablissemeats Michelin. Crown brake with crown fastened to the wheel. 4,477,120, Cl. 301-6.00W.

Jandrasi, Frank J., to General Signal Corp. Shut-off valve for high temperature erosive flow. 4,477,053, Cl. 251-86.000.

Janssen, Petrus J.; and van der Hulst, Victor A., to U.S. Philips Corporation. Device for drawing an optical fibre. 4,477,274, Cl. 65-13.000.

Janutka, William J., to Eaton Corporation. Three terminal bidirectional drain to drain FET circuit. 4,477,742, Cl. 307-571.000.

Jeffers, Richard D.: *See*—
Drucker, Alan S.; D'Aversa, Richard D.; and Jeffers, Richard D., 4,476,920, Cl. 165-29.000.

Jencks, Charles L.: *See*—
Castonguay, Roger N.; and Jencks, Charles L., 4,477,701, Cl. 200-50.0AA.

Jennings, Dale L.: *See*—
Holland, Charles L.; and Jennings, Dale L., 4,477,012, Cl. 228-181.000.

Jensen, George W. Locking ring and stapling system. 4,476,616, Cl. 29-243.560.

Jenuwine, William C.: *See*—
Cleveland, Dixon; Havens, James R.; Nagel, Gregory L.; Decina, Basil A., Jr.; and Jenuwine, William C., 4,477,709, Cl. 219-109.000.

Jervis, Daniel A., to Eastman Kodak Company. Liquid dough conditioners and dough product containing same. 4,477,479, Cl. 426-549.000.

Jesse, Joachim: *See*—
Mayer, Udo; Hahn, Erwin; and Jesse, Joachim, 4,477,381, Cl. 260-392.000.

Jewusiak, Stephen J.: *See*—
Failla, Stephen J.; Jewusiak, Stephen J.; and Zwaskis, William J., 4,476,865, Cl. 128-326.000.

Jiles, Walter K.: *See*—
Lowery, James O.; Thomas, O. Leon; Baston, Nathan I.; Smith, Darrell L.; Jiles, Walter K.; and Starnes, R. Emory, Jr., 4,477,769, Cl. 324-54.000.

Jog-et, Inc.: *See*—
Appelbaum, Paul, 4,477,070, Cl. 272-70.000.

Johannes Heidenhain GmbH: *See*—
Ernst, Alfons, 4,477,189, Cl. 356-374.000.
Reichi, Alfred, 4,477,726, Cl. 250-237.00G.

Johanson, Ralph E.: *See*—
Madsen, Scott T.; and Johanson, Ralph E., 4,476,686, Cl. 62-63.000.

Johansson, Ingvar; and Sterner, Hans A. Piston ring assembly for hydraulic mechanisms, particularly such mechanisms for very high operating pressures. 4,477,090, Cl. 277-174.000.

John T. Hepburn Limited: *See*—
Foster, Derek; and Rich, Colin, 4,476,801, Cl. 114-230.000.

John Zink Company: *See*—
Cegielski, John M., Jr., 4,476,791, Cl. 110-346.000.

Johnson, Arne I. Marine riser buoyancy assembly. 4,477,207, Cl. 405-195.000.

Johnson, Dale R.; and Ciciora, John A., to Johnson Engineering Corporation. Remote control for motor vehicle. 4,476,954, Cl. 180-333.000.

Johnson, Edwin A.; and Leung, Chun K., to Bendix Corporation, The. Phase angle modification of the torque amplitude for fuel distribution control systems. 4,476,833, Cl. 123-436.000.

Johnson Engineering Corporation: *See*—
Johnson, Dale R.; and Ciciora, John A., 4,476,954, Cl. 180-333.000.

Johnson, Jerry J., Sr.: *See*—
Van Duyn, Paul D.; and Johnson, Jerry J., Sr., 4,477,864, Cl. 362-311.000.

Johnson & Johnson Products, Inc.: *See*—
Silbering, Steven B.; and Sipos, Tibor, 4,477,428, Cl. 424-52.000.
Silbering, Steven B.; and Sipos, Tibor, 4,477,429, Cl. 424-52.000.

Johnson, Lonnie G. Thermal energy accumulation. 4,476,693, Cl. 62-402.000.

Johnson, Ronald E.; and Wu, Lung-ming, to Corning Glass Works. Decalcomania. 4,477,510, Cl. 428-200.000.

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Yamada, Masanori; and Katsuma, Makoto, 4,477,170, Cl. 354-415.000.

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Kawabata, Yoshio: *See*—
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Keller, Teddy M., to United States of America, Navy. Fluorinated polyurethanes. 4,477,643, Cl. 528-70.000.

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Collins, Robert F.; and Paul, Amy S., 4,476,860, Cl. 128-132.00D.
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Riggs, Olen L., Jr., 4,477,320, Cl. 204-96.000.

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Giboulet, Andre ; Henry, Georges; and Kieffer, Jean, 4,477,691, Cl. 174-22.00C.

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Gehlhaus, Juergen; and Kieser, Manfred, 4,477,681, Cl. 568-336.000.

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Sega, Masahisa; and Kikuchi, Akira, 4,477,221, Cl. 414-735.000.

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Thaler, Arnold; Friedson, David; and Kin, Lai, 4,477,716, Cl. 219-225.000.

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Bohannon, William D., Jr.; Kinard, Michael D.; and Schneider, Randy G., 4,477,298, Cl. 156-54.000.

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Vifian, Paul R.; and Kint, Gregory C., 4,477,030, Cl. 241-208.000.

Kirby, Jarvis: *See*—
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Kircher, Dieter: *See*—
Belart, Juan; Kircher, Dieter; Budecker, Ludwig; and Obersteiner, Georg, 4,477,125, Cl. 303-116.000.

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Bergna, Horacio E.; and Kirkland, Joseph J., 4,477,492, Cl. 427-215.000.

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Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,664, Cl. 544-360.000.
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Koya, Masahiro; Maeda, Narimichi; Ishizuka, Kohei; Takaoka, Kazuhiko; Kokuryo, Yoshiro; and Kita, Yasuhiro, 4,477,913, Cl. 375-13.000.

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Robinson, Thomas C.; and Kitrilakis, Sotiris, 4,476,821, Cl. 123-68.000.

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Brumbaugh, Charles T.; Pittenger, Robert L.; and Klees, Robert M., 4,477,814, Cl. 343-725.000.

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Klein, Joseph T.: *See*—
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Schwarz, Rudolf; and Kleiner, Walter, 4,476,899, Cl. 139-1.00E.

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Bryson, John W., 4,476,972, Cl. 198-415.000.

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Hagemann, Hans J.; Hunten, Siegfried; Wernicke, Rolf; Klomp, Cornelius J.; and Noorlander, Willem, 4,477,401, Cl. 264-61.000.

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Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, to Aligena AG. Modified acrylonitrile polymer containing semipermeable membranes. 4,477,634, Cl. 525-327.100.

Lindman, Nils T.; Fransson, Lars H.; and Pott, Carl C., to U.S. Philips Corporation. Picture display arrangement. 4,477,830, Cl. 358-1.000.

Lindstrom, Nils-Georg: *See*—
Nilsson, Rolf; and Lindstrom, Nils-Georg, 4,477,101, Cl. 280-461.00A.

Linfield, Warner M.: *See*—
Serota, Samuel; and Linfield, Warner M., 4,477,384, Cl. 260-410.90R.

Linger, Claude J. A.; and Locicero, Gisele C., to International Business Machines Corporation. Process for inspecting and automatically sorting objects showing patterns with constant dimensional tolerances and apparatus for carrying out said process. 4,477,926, Cl. 382-8.000.

Lis, Andrzej: *See*—
Olszewski, Witold; Lis, Andrzej; Pietraszek, Pawel; and Tuznik, Franciszek S., 4,477,344, Cl. 210-109.000.

Lissiuk, Walter: *See*—
Spence, Clifton L.; and Lissiuk, Walter, 4,477,165, Cl. 354-299.000.

Liston, Max D.; Dickinson, David G.; and Stark, William A., to American Hospital Supply Corporation. Multichannel spectrophotometer. 4,477,190, Cl. 356-418.000.

Litke, Alan E., to Loctite Corporation. Thixotropic cyanoacrylate compositions. 4,477,607, Cl. 523-212.000.

Litton Industrial Products, Inc.: *See*—
Dunn, Elman R., 4,476,847, Cl. 125-11.0DF.

Ljung, Bo H. G.: *See*—
Stiles, John C.; and Ljung, Bo H. G., 4,477,188, Cl. 356-350.000.

Lloyd, Frederick W.: *See*—
Brown, Peter L.; Fitzpatrick, Patrick C.; and Lloyd, Frederick W., 4,477,071, Cl. 272-72.000.

Locicero, Gisele C.: *See*—
Linger, Claude J. A.; and Locicero, Gisele C., 4,477,926, Cl. 382-8.000.

Lockhart, Thomas P., to General Electric Company. One package, stable, moisture curable, alkoxy-terminated organopolysiloxane compositions. 4,477,625, Cl. 524-789.000.

Lockheed Corporation: *See*—
Rogers, Alisa K.; and Weber, Kenneth E., 4,477,329, Cl. 137-93.000.

Lockley Services Pty. Ltd.: *See*—
Tomlinson, Roderick P. J., 4,477,593, Cl. 346-205.000.

Lockwood, James F., to Imperial Underground Sprinkler Co. Bubbler head structure. 4,477,026, Cl. 239-428.500.

Locotos, Frank M.: *See*—
Hipkins, Edward C., Jr.; and Locotos, Frank M., 4,477,209, Cl. 405-261.000.

Loctite Corporation: *See*—
Lin, Samuel Q. S., 4,477,326, Cl. 204-159.130.
Litke, Alan E., 4,477,607, Cl. 523-212.000.

Loevinger, Richard. Heated railroad tank car. 4,476,788, Cl. 105-451.000.

LogEtronics, Inc.: *See*—
Spence, Clifton L.; and Lissiuk, Walter, 4,477,165, Cl. 354-299.000.

Login, Robert B., to BASF Wyandotte Corporation. Graft polyesters and sized textiles. 4,477,525, Cl. 428-395.000.

Logue, Clyde L.: *See*—
Lee, Jonathan P.; and Logue, Clyde L., 4,476,852, Cl. 126-289.000.

Lohr & Brompkamp GmbH: *See*—
Welschof, Hans-Heinrich, 4,476,950, Cl. 180-73.300.

Loiacono, Marco: *See*—
Cellone, Luigi; and Loiacono, Marco, 4,477,564, Cl. 430-567.000.

Lokvig, Tor, to Intervisual Communications Inc. Trigger actuated puppet. 4,476,650, Cl. 446-362.000.

Long, Daniel C. Hand care glove product and method of making same. 4,476,588, Cl. 2-169.000.

Longo, Trent F.; Sagar, Vispi R.; and Stayer, Mark L., to Firestone Tire & Rubber Company, The. Method for removing sodium salts from polyphosphazene polymer solutions. 4,477,656, Cl. 528-487.000.

Lord Corporation: *See*—
Warnaka, Glenn E., 4,477,505, Cl. 428-160.000.

L'OREAL: *See*—
Grollier, Jean F., 4,477,375, Cl. 252-542.000.

Losq, Jacques J.; Rao, Gururaj S.; and Sachar, Howard E., to International Business Machines Corporation. Decode history table for conditional branch instructions. 4,477,872, Cl. 364-200.000.

Lossack, Edgar; Spriestersbach, Jochen; Baur, Josef; and Schwab, Wilfried, to Maschinenfabrik Muller-Weingarten A.G. Diecasting method for producing cast pieces which are low in gas, pores and oxides, as well as diecasting machine for implementing the method. 4,476,911, Cl. 164-65.000.

Loudin, Philip B., to Illinois Tool Works Inc. Reusable casing and carrier for use in producing sausage. 4,476,609, Cl. 17-1.00R.

Lowe & Fletcher Limited: *See*—
Herriott, Leslie V., 4,476,701, Cl. 70-276.000.

Lowery, A. J. Plastic fence. 4,477,058, Cl. 256-19.000.

Lowery, James O.; Thomas, O. Leon; Baston, Nathan I.; Smith, Darrell L.; Jiles, Walter K.; and Starnes, R. Emory, Jr., to Southwire Company. Cable plexer fault locator. 4,477,769, Cl. 324-54.000.

Lozaun, Gary D., to Container Corporation of America. Two-piece, self-locking container. 4,477,015, Cl. 229-23.00R.

LTV Aerospace and Defense Company: *See*—
Case, William E., 4,477,906, Cl. 372-41.000.

Lubniewski, Stephen E.; and Haggenmiller, Christian, to United States of America, Air Force. Wet film applicator. 4,476,806, Cl. 118-110.000.

Lubrizol Corporation, The: *See*—
Steckel, Thomas F., 4,477,362, Cl. 252-51.50R.

Lucas Industries Limited: *See*—
Dufft, Jurgen, 4,477,010, Cl. 228-138.000.
Palmer, Christopher W.; and Hughes, Ronald M., 4,476,963, Cl. 188-79.50B.
Timmis, John P., 4,477,293, Cl. 148-31.500.

Luchsinger, Patrick M., to Deere & Company. Method for molding elongated workpieces. 4,477,406, Cl. 264-275.000.

Luft, Gunter: *See*—
Richter, Gerhard; Luft, Gunter; and Gebhardt, Ulrich, 4,477,314, Cl. 204-1.00T.

Luigi, Picotti. Process for performing the construction of a parking grip chock for a vehicle and parking grip chock for a vehicle manufactured from sheet. 4,476,961, Cl. 188-32.000.

Lukaszewicz, George, to Shell Canada Limited. Drainage seal for sewage system. 4,476,603, Cl. 15-104.3SN.

Luke, John A., to Brown & Williamson Tobacco Corporation. Tobacco smoke filters. 4,476,882, Cl. 131-336.000.

Luoma, Thomas; and Rutherford, Alan, to Nicolet Zeta. Graphic recorder. 4,477,822, Cl. 346-136.000.

Lux, Gregory F. Disc rotor permanent magnet generator. 4,477,745, Cl. 310-156.000.

Luyckx, Robert R., to General Motors Corporation. Articulated coach air transfer system. 4,477,099, Cl. 280-421.000.

Lybolt, Arden F. Wood handling tool. 4,477,113, Cl. 294-16.000.

Lynch, Brian; and Partus, Fred P., to AT&T Technologies, Inc. Method of and apparatus for straightening and configuring a preform tube from which lightguide fiber is drawn. 4,477,273, Cl. 65-3.120.

Lynott, John J.: *See*—
Dalziel, Warren L.; Flanigan, Charles D.; and Lynott, John J., 4,477,851, Cl. 360-95.000.

M/A Com, Inc.: *See*—
Collinet, Jean C.; and Slyke, Mark V., 4,477,788, Cl. 333-235.000.

Maben, Duane K., to Sperry Corporation. Ribbon cable wire end forming tool. 4,476,905, Cl. 140-105.000.

Machida, Yukihiko: *See*—
Nakano, Kenji; Machida, Yukihiko; and Odaka, Kentaro, 4,477,844, Cl. 360-8.000.

Machonis, John, Jr.: *See*—
Schmukler, Seymour; Machonis, John, Jr.; and Shida, Mitsuzo, 4,477,532, Cl. 428-441.000.

Macmorine, Hilda G.: *See*—
Healy, George M.; Sun, Anthony M.; and Macmorine, Hilda G., 4,477,567, Cl. 435-71.000.

Madon, Rostam J., to Exxon Research and Engineering Co. Liquid hydrocarbon synthesis using supported ruthenium catalysts. 4,477,595, Cl. 518-715.000.

Madsen, Scott T.; and Johanson, Ralph E., to BOC Group, Inc., The. Methods and apparatus for chilling a product. 4,476,686, Cl. 62-63.000.

Maeda, Narimichi: *See*—
Koya, Masahiro; Maeda, Narimichi; Ishizuka, Kohei; Takaoka, Kazuhiko; Kokuryo, Yoshiro; and Kita, Yasuhiro, 4,477,913, Cl. 375-13.000.

Maeda, Toyoo: *See*—
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,477,437, Cl. 424-116.000.

Maejima, Hisashi: *See*—
Takanashi, Akihiro; Hashimoto, Norikazu; Maejima, Hisashi; and Sugiyama, Shuji, 4,477,182, Cl. 355-43.000.

Maerfeld, Charles; and Lardat, Claude, to Thomson-CSF. Surface wave dispersive acoustic delay line. 4,477,784, Cl. 333-153.000.

Magin, Ludwig B., to Deere & Company. Selective driving mechanism. 4,476,743, Cl. 74-665.0GB.

Magnavox Consumer Electronics Company: *See*—
Close, Ernest F., 4,477,924, Cl. 381-15.000.

Magnetic Analysis Corporation: *See*—
Spierer, Edward, 4,477,776, Cl. 324-227.000.
Magyar Aluminiumipari Troeszt: *See*—
Matyasi, Jozsef; Kaptay, Gyorgy; Zsembery, Laszlo ; Kokeny, Bela; Toth, Jozsef T.; Toth Nee Homostrei, Maria; and Penzes, Imre, 4,477,427, Cl. 423-628.000.
Maheshwary, Ashok K.: *See*—
Ayers, William M.; Maheshwary, Ashok K.; and Young, Peter J., 4,477,348, Cl. 210-242.300.
Mahler, Gert: *See*—
Viertel, Lothar; and Mahler, Gert, 4,477,116, Cl. 296-97.00H.
Makara, Gyorgy, to Futober Epuletgepeszeti Termekeket Gyarto Vallalat. Ventilating and heating apparatus and heat-sensitive unit. 4,477,020, Cl. 236-49.000.
Makhlouf, Joseph M.; McCollum, Gregory J.; and Kerr, Paul R., to PPG Industries, Inc. Method of in-mold coating. 4,477,405, Cl. 264-250.000.
Malec, Jerry P., to Dual Dynamics, Inc. Apparatus for indicating tire pressure. 4,476,803, Cl. 116-34.00R.
Maleszka, Ryszard: *See*—
Schneider, Henry; Maleszka, Ryszard; Wang, Patrick Y.; Veliky, Ivan A.; and Chan, Yui-Kwok, 4,477,569, Cl. 435-161.000.
Mallon, Joseph R.: *See*—
Kurtz, Anthony D.; Mallon, Joseph R.; and Nunn, Timothy A., 4,476,726, Cl. 73-708.000.
Malvick, David L., to United States of America, Navy. Deployment mechanism for an electronic array. 4,477,818, Cl. 343-881.000.
Mancillas, Gene: *See*—
Boles, Joel L.; and Mancillas, Gene, 4,476,931, Cl. 166-294.000.
Manente, Joseph C., Jr.: *See*—
Hoffman, Paul L.; and Manente, Joseph C., Jr., 4,477,089, Cl. 277-153.000.
Manica, Michele: *See*—
Danesi, Sergio; Forti, Sergio; and Manica, Michele, 4,477,631, Cl. 525-133.000.
Manizza, Guelfo A., to Federal Paper Board Company, Inc. Closure interlock for wrap around cartons and including separator tabs. 4,476,977, Cl. 206-434.000.
Manutis: *See*—
Tortellier, Christian, 4,476,959, Cl. 187-9.00R.
Manzoni, Stephane. Device for indexing the arm or casting of a vehicle rearview-mirror. 4,477,199, Cl. 403-93.000.
Marconi Company Limited, The: *See*—
Beaumont, David A.; and King, Michael A., 4,477,834, Cl. 358-113.000.
Maremont Corporation: *See*—
Smeltzer, Paul; Shah, Mahesh N.; and Guzder, Shapoor B., 4,477,062, Cl. 267-64.280.
Margerum, Donald L., to Raytheon Company. Frequency measuring apparatus. 4,477,773, Cl. 324-79.00R.
Maringer, Melvin F.: *See*—
Biggs, James W.; and Maringer, Melvin F., 4,477,523, Cl. 428-389.000.
Mark Products Incorporated: *See*—
Smith, J. David, 4,477,136, Cl. 339-49.00R.
Mark, Victor, to General Electric Company. Flame retardant copolyester-carbonate compositions. 4,477,632, Cl. 525-147.000.
Mark, Victor; and Hedges, Charles V., to General Electric Company. Polyarylate resin of thiodiphenols and isophthalic acid or derivatives thereof. 4,477,647, Cl. 528-176.000.
Marker-Patentverwertungsgesellschaft: *See*—
Knabel, Walter; and Messerschmidt, Werner, 4,477,102, Cl. 280-615.000.
Martin, Lawrence L.; and Setescak, Linda L., to Hoechst-Roussel Pharmaceuticals Inc. Substituted 4,10-dihydro-10-oxothieno benzoxepins. 4,477,465, Cl. 424-275.000.
Martin Marietta Corporation: *See*—
Alexius, Richard C., 4,477,056, Cl. 251-282.000.
Martinez, Louie. Portable, hand-mountable defense weapon system. 4,477,005, Cl. 224-218.000.
Maruyama, Satoshi: *See*—
Mukae, Kazuo; Maruyama, Satoshi; Tsuda, Koichi; and Nagasawa, Ikuo, 4,477,793, Cl. 338-21.000.
Maruyama, Toshinori: *See*—
Akita, Yoshio; Teshima, Takanori; Torii, Koshi; and Maruyama, Toshinori, 4,477,766, Cl. 322-28.000.
Marvin Glass & Associates: *See*—
Zaruba, John V., 4,476,649, Cl. 446-114.000.
Maschinenfabrik Alfred Schmermund GmbH & Co.: *See*—
Oberdorf, Manfred, 4,476,665, Cl. 53-575.000.
Maschinenfabrik Karl Zangs AG: *See*—
Conrads, Hans; Hoffmans, Josef; Hippel, Hans; Hoven, Hubert; Rolauusf, Hans; and Schafer, Max, 4,476,793, Cl. 112-221.000.
Maschinenfabrik Muller-Weingarten A.G.: *See*—
Lossack, Edgar; Spriestersbach, Jochen; Baur, Josef; and Schwab, Wilfried, 4,476,911, Cl. 164-65.000.
Masciale, John M.: *See*—
Kubacki, Edward F.; Jacobs, Edward C.; Masciale, John M.; and Monroe, James R., 4,476,781, Cl. 101-3.00R.
Mash, Derek H., to ITT Industries, Inc. Smectic liquid crystal cell with heat pulse and laser. 4,477,151, Cl. 350-351.000.
Masi, James V.: *See*—
Barnett, Allen M.; Catalano, Anthony W.; Dalal, Vikram L.; Masi, James V.; Meakin, John D.; and Hall, Robert B., 4,477,688, Cl. 136-258.000.
Maslennikov, Konstantin N.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Turutin, Veniamin S.; Bezchastnov, Gennady A.; and Telezhnikov, Jury F., 4,477,690, Cl. 174-15.00C.
Massett, Stephen S., to Pfizer Inc. Processes and intermediates useful in the preparation of flutroline. 4,477,669, Cl. 546-85.000.
Massett, Stephen S.: *See*—
Cue, Berkeley W.; and Massett, Stephen S., 4,477,671, Cl. 546-291.000.
Masuda, Shigeru: *See*—
Mori, Teijiro; Masuda, Shigeru; Okado, Hiroyuki; Kakizoe, Masahiro; and Sako, Yuji, 4,477,704, Cl. 200-144.00R.
Masuda, Yugoro; and Kawase, Shigeru, to Kanebo, Ltd. Wadding materials. 4,477,515, Cl. 428-288.000.
Matkemi AG: *See*—
Friess, Jean, 4,477,057, Cl. 251-306.000.
Mats, Matvei M.: *See*—
Kanshin, Nikolai N.; Guskov, Igor A.; Konoplev, Alexei A.; Sachkov, Alexandr E.; and Mats, Matvei M., 4,476,863, Cl. 128-305.000.
Matsufuji, Yohji; Togano, Shigeo; and Ichihashi, Hiroo, to Canon Kabushiki Kaisha. Ink jet recording apparatus. 4,477,823, Cl. 346-140.00R.
Matsumoto, Katsutoshi, to Dainippon Screen Mfg. Co., Ltd. Method of glazing printing area in thick printing. 4,476,782, Cl. 101-450.100.
Matsumoto, Toshiaki, to Minolta Camera Kabushiki Kaisha. Cameras with a film loading device for facilitating film loading. 4,477,162, Cl. 354-173.110.
Matsumoto, Toshiaki; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Film Transporting device for use in a camera. 4,477,163, Cl. 354-173.110.
Matsumoto, Yasuji, to Toshiba Silicone Co., Ltd. Curable silicone composition. 4,477,641, Cl. 528-15.000.
Matsumoto, Yoshio: *See*—
Muroi, Soichi; Seta, Shigetoshi; Matsumoto, Yoshio; Yasui, Koichi; and Imamura, Kazuyoshi, 4,477,636, Cl. 525-444.000.
Matsuo, Itaru: *See*—
Gomi, Shimpei; Takeuchi, Tomomitsu; Matsuo, Itaru; Fujii, Masaki; Takatsuka, Toru; and Watari, Ryuzo, 4,477,334, Cl. 208-75.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Asada, Seigo, 4,477,837, Cl. 358-310.000.
Nakano, Hiromitsu; and Yoshida, Isao, 4,477,752, Cl. 318-331.000.
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Omata, Yuji, 4,477,794, Cl. 338-32.00R.
Ohki, Yoshimasa; Toyoda, Yukio; Kobayashi, Hiroyuki; and Akasaki, Isamu, 4,476,620, Cl. 29-569.00L.
Sugita, Ryuji; Kanai, Kenji; Sasaki, Seishi; and Takahashi, Ken, 4,477,488, Cl. 427-129.000.
Uya, Masaru; and Kawamoto, Kinji, 4,476,763, Cl. 84-1.030.
Matsuura, Tamiaki; Aiba, Takeshi; Fukushima, Takashi; Nishimura, Masanori; Ohtsuki, Hiroshi; Yabuki, Fujio; and Kusakabe, Tomio, to Sony Corporation. Automatic assembling machine. 4,476,627, Cl. 29-791.000.
Matsuzaka, Takashi: *See*—
Hisaoka, Satoshi; Matsuzaka, Takashi; and Saito, Toshihiko, 4,477,246, Cl. 431-114.000.
Matyasi, Jozsef; Kaptay, Gyorgy; Zsembery, Laszlo ; Kokeny, Bela; Toth, Jozsef T.; Toth Nee Homostrei, Maria; and Penzes, Imre, to Magyar Aluminiumipari Troeszt. Process for the preparation of alkali-poor α-alumina for ceramic purposes. 4,477,427, Cl. 423-628.000.
Mauser-Werke Oberndorf GmbH: *See*—
Hoffman, Dietrich; and Gotz, Udo, 4,476,785, Cl. 102-522.000.
Mausner, Eberhard, to Robert Bosch GmbH. Sensor for acceleration. 4,477,732, Cl. 307-9.000.
Maxcap, Inc.: *See*—
Nolan, Robert L., 4,476,987, Cl. 215-319.000.
Maxim, John. Float activated toy vehicle. 4,476,648, Cl. 446-166.000.
Maxs AG: *See*—
Greutert, Albert; and Gasser, Ruedy, 4,476,776, Cl. 99-302.00C.
May, Bronislav H.: *See*—
Ledent, Michel A. O.; and May, Bronislav H., 4,477,390, Cl. 260-502.50E.
Mayer, James R. Hydraulically actuated reciprocating piston pump. 4,477,232, Cl. 417-342.000.
Mayer, Udo; Hahn, Erwin; and Jesse, Joachim, to BASF Aktiengesellschaft. Triaminotriarylmethane colorants. 4,477,381, Cl. 260-392.000.
McCarley, Edgar L., to International Telephone & Telegraph Corporation. Channel monitor for connection to channel lines. 4,477,873, Cl. 364-200.000.
McCollum, Gregory J.: *See*—
Makhlouf, Joseph M.; McCollum, Gregory J.; and Kerr, Paul R., 4,477,405, Cl. 264-250.000.
Singer, Debra L.; McCollum, Gregory J.; Dowbenko, Rostyslaw; Christenson, Roger M.; Chau, Michael M.; and Chang, Wen-Hsuan, 4,477,618, Cl. 524-157.000.
McDaniel, Max P., to Phillips Petroleum Company. Polymerization of olefins. 4,477,586, Cl. 502-104.000.
McDonnell Douglas Corporation: *See*—
Boulton, Donald G.; and Arcangeli, Gerald T., 4,477,039, Cl. 244-53.00B.
McGowan, Neil S. Device for micro tuning pianos and other stringed instruments. 4,476,770, Cl. 84-458.000.

McGraw-Edison Company: *See*—
Urani, Angelo, 4,477,139, Cl. 339-88.00R.
McGuire, Kenyon E. B.: *See*—
Nossen, Steve J.; Brokl, Stanley S.; and McGuire, Kenyon E. B., 4,477,918, Cl. 377-37.000.
McHale, William D.: *See*—
Kresge, Charles T.; Krishnamurthy, Sowmithri; and McHale, William D., 4,477,590, Cl. 502-334.000.
McInerney, Charles E., to Garrett Corporation, The. Turbocharged internal combustion engine having an altitude compensated boost control and method for its operation. 4,476,682, Cl. 60-602.000.
McKay, Leon A. Aerating means. 4,476,938, Cl. 172-22.000.
McKay, Randal P.: *See*—
Eisenhardt, William A., Jr.; Saleeb, Fouad Z.; McKay, Randal P.; and Zeller, Bary L., 4,477,481, Cl. 426-590.000.
McKean, John A., to Titan Tool Company. Automatic stud driver. 4,476,749, Cl. 81-53.200.
McKenzie, Donald E.: *See*—
Grantham, LeRoy F.; and McKenzie, Donald E., 4,477,373, Cl. 252-626.000.
McKenzie, Larry G.; and Powell, Leon T. Archery target with replacable target segment. 4,477,082, Cl. 273-403.000.
McLaughlin, Joseph E.: *See*—
Antonelli, Joseph A.; McLaughlin, Joseph E.; and Strolle, Clifford H., 4,477,534, Cl. 428-461.000.
McLeod, Arlis D. Reversible mattress. 4,476,594, Cl. 5-464.000.
McMahan, William H., to American Laser Corporation. Low power argon-ion gas laser. 4,477,907, Cl. 372-64.000.
McNichols, Larry A.: *See*—
Sorenson, Paul D.; Dickson, Dale A.; McNichols, Larry A.; and Badzinski, John D., 4,476,873, Cl. 128-660.000.
McVey, Charles W.: *See*—
Bellino, Ralph R.; and McVey, Charles W., 4,476,995, Cl. 220-371.000.
McWhirter Holdings Pty. Limited: *See*—
McWhirter, Ian; and Morgan, Richard B., 4,477,848, Cl. 360-60.000.
McWhirter, Ian; and Morgan, Richard B., to McWhirter Holdings Pty. Limited. Verification of recorded messages. 4,477,848, Cl. 360-60.000.
Mead Corporation, The: *See*—
Bean, Harley F., 4,477,218, Cl. 414-36.000.
Mead, Jonathan T.: *See*—
Ismail, Raouf A.; and Mead, Jonathan T., 4,476,720, Cl. 73-202.000.
Meade, James H.: *See*—
Chang, Shing; and Meade, James H., 4,477,571, Cl. 435-253.000.
Meade, John F.: *See*—
Kotzur, Frank W.; Kotzur, Gregory A.; Meade, John F.; and Hopko, Donald J., 4,477,033, Cl. 242-18.00A.
Meakin, John D.: *See*—
Barnett, Allen M.; Catalano, Anthony W.; Dalal, Vikram L.; Masi, James V.; Meakin, John D.; and Hall, Robert B., 4,477,688, Cl. 136-258.000.
Mechanical Technology Incorporated: *See*—
Dineen, John J., deceased, 4,476,681, Cl. 60-486.000.
Mechtron International Corporation: *See*—
Brashears, David F.; Elliott, Emanuel J.; and Butler, Theodore G., 4,477,250, Cl. 432-3.000.
Meckel, Walter: *See*—
Kohler, Robert; Nippe, Burkhard; Kober, Heinrich; Schilffarth, Karlchristian; Meckel, Walter; and Quiring, Bernd, 4,477,531, Cl. 428-425.900.
Medcalf, Darrell G.: *See*—
Seidel, William C.; Orozovich, George E.; and Medcalf, Darrell G., 4,477,480, Cl. 426-578.000.
Medical & Scientific, Inc.: *See*—
Miles, Laughton E.; Rogers, Arthur H., Jr.; and Rogers, Charles H., 4,477,578, Cl. 436-518.000.
Medtronic, Inc.: *See*—
Sorenson, Paul D.; Dickson, Dale A.; McNichols, Larry A.; and Badzinski, John D., 4,476,873, Cl. 128-660.000.
Thompson, David L., 4,476,868, Cl. 128-419.0PG.
Meek, James S. Automobile body dent puller. 4,476,705, Cl. 72-478.000.
Meermoller, Theodor; and Greshof, Heinrich, to Westfalia Separator AG. Device for automatically rinsing milking systems. 4,476,808, Cl. 119-14.180.
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Terui, Nobuhiko; Watanabe, Sakuji; and Meguro, Hiroshi, 4,477,169, Cl. 354-409.000.
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Guerin, Yves; and Meister, Pierre-Andre , 4,477,759, Cl. 318-696.000.
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Szlam, Aleksander; and Quinn, Chester P., 4,477,698, Cl. 179-90.0BD.
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Garlaschelli, Luigi; Gozzo, Franco; Mendillo, Vincenzo; Garavaglia, Carlo; Mirenna, Luigi; and Zagni, Angela, 4,477,461, Cl. 424-272.000.
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Mennen Company, The: *See*—
Suffis, Robert; and Barchas, Myron, 4,477,431, Cl. 424-66.000.
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Bender, Dean R.; Karady, Sandor; and Rothauser, Theresa, 4,477,668, Cl. 546-72.000.
Boger, Joshua S.; and Veber, Daniel F., 4,477,440, Cl. 424-177.000.
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Shepard, Kenneth L., 4,477,466, Cl. 424-275.000.
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Gehlhaus, Juergen; and Kieser, Manfred, 4,477,681, Cl. 568-336.000.
Jonas, Rochus; Kloft, Michael; Wurziger, Hanns; Harting, Juergen; Enenkel, Hans J.; Minck, Klaus-Otto; and Schliep, Hans-Jochen, 4,477,454, Cl. 424-250.000.
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Giboulet, Andre ; Henry, Georges; and Kieffer, Jean, 4,477,691, Cl. 174-22.00C.
Messelt, Christopher D.: *See*—
Strange, Carl P.; Messelt, Christopher D.; and Gibson, Clark W., 4,477,657, Cl. 536-91.000.
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Knabel, Walter; and Messerschmidt, Werner, 4,477,102, Cl. 280-615.000.
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Hochreuther, Karl; and Tragatschnig, Jorg, 4,476,721, Cl. 73-431.000.
Mex Research Associates: *See*—
Deutsch, Alice; Brandwein, Harvey; Platt, Herbert; Hunter, Dianne M.; Dubitsky, Andrew; and Durham, Susan M., 4,477,576, Cl. 436-500.000.
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Fushida, Akira; Kato, Yoshiaki; and Kamezaki, Yasushi, 4,477,551, Cl. 430-133.000.
Miale, Joseph N., to Mobil Oil Corporation. Reactivation of steam-deactivated catalysts. 4,477,582, Cl. 502-26.000.
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Euvrard, Hubert, 4,477,253, Cl. 433-126.000.
Microlife Technics, Inc.: *See*—
Gonzalez, Carlos F., 4,477,471, Cl. 426-43.000.
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Dalziel, Warren L.; Flanigan, Charles D.; and Lynott, John J., 4,477,851, Cl. 360-95.000.
Midgley, Noel H. Hand grip. 4,476,742, Cl. 74-551.900.
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Willms, Lothar; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,477,276, Cl. 71-94.000.
Miles, Clive: *See*—
Baker, Kenneth J.; Buck, Keith E.; Chase, Irving C.; Fraser, Robert B.; and Miles, Clive, 4,476,708, Cl. 73-23.000.
Miles Laboratories, Inc.: *See*—
Verboom, Gilles M. L.; Bliznik, Kenneth E.; and Welsh, Thomas L., 4,477,365, Cl. 252-156.000.
Miles, Laughton E.; Rogers, Arthur H., Jr.; and Rogers, Charles H., to Medical & Scientific, Inc. Method and apparatus for performing assays. 4,477,578, Cl. 436-518.000.
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Hultman, Rolf O., 4,477,433, Cl. 424-93.000.
Millar, Thomas D.; and Phillips, Dougald S. M., to AHI Operations Limited. Liquid measuring devices. 4,476,719, Cl. 73-200.000.
Miller, Donald A.: *See*—
Nagumo, George; Miller, Donald A.; and Lieberman, Paul, 4,477,888, Cl. 367-152.000.
Miller, Lee E.; and Carr, Dennis D., to Eagle-Picher Industries, Inc. Metal-gas cell with electrolyte reservoir. 4,477,540, Cl. 429-27.000.
Miller, Lee E.: *See*—
Wheeler, James R.; Brill, Jack N.; and Miller, Lee E., 4,477,546, Cl. 429-211.000.
Miller, Marie Z. Animal pet medical collar. 4,476,814, Cl. 119-106.000.

Miller, Paul B.: *See—*
Krabec, James A.; Kincaid, John W.; and Miller, Paul B., 4,477,693, Cl. 174-36.000.

Mills, J. T., to Sentinel Manufacturing Company, Inc. Engine protective apparatus with remote override. 4,476,825, Cl. 123-198.0DB.

Mimura, Takashi; Hikosaka, Kohki; and Odani, Kouichiro, to Fujitsu Limited. Process and apparatus for fabricating a semiconductor device. 4,477,311, Cl. 156-643.000.

Minagawa, Motonobu; Nakahara, Yutaka; and Shibata, Toshihiro, to Adeka Argus Chemical Co., Ltd. Tetra-(2,2,6,6-tetramethyl-4-piperidinyl)-3-methyl-5-(1'2'-biscarboxylate)-ethyl-cyclohexane or 3-cyclohexene-1,2-dicarboxylates and synthetic resin compositions containing the same. 4,477,616, Cl. 524-102.000.

Minami, Hisashi: *See—*
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,477,437, Cl. 424-116.000.

Minamida, Katsuhiro: *See—*
Sakai, Kango; Yoshihara, Ryoichi; Sakurai, Hiroshi; and Minamida, Katsuhiro, 4,477,316, Cl. 204-290.00F.

Minck, Klaus-Otto: *See—*
Jonas, Rochus; Kloft, Michael; Wurziger, Hanns; Harting, Juergen; Ensenkel, Hans J.; Minck, Klaus-Otto; and Schliep, Hans-Jochen, 4,477,454, Cl. 424-250.000.

Mineral Deposits Limited: *See—*
Giffard, Philip J., 4,476,980, Cl. 209-459.000.

Minnebraker, Jeffrey P., to Quadra Wheelchairs, Inc. Wheelchair construction. 4,477,098, Cl. 280-242.0WC.

Minnesota Mining and Manufacturing Company: *See—*
Cellone, Luigi; and Loiacono, Marco, 4,477,564, Cl. 430-567.000.
Fanselow, Dan L.; Cobb, Sanford, Jr.; and Bergsten, Ronald E., 4,476,593, Cl. 5-417.000.
Foslien, Floyd L., 4,477,007, Cl. 227-19.000.
Mitra, Smarajit, 4,477,635, Cl. 525-437.000.
Struble, Kent R., 4,477,008, Cl. 227-19.000.
Zeller-Pendrey, Jeanine I., 4,477,562, Cl. 430-513.000.

Minolta Camera Kabushiki Kaisha: *See—*
Ishikawa, Norio; and Miki, Yukio, 4,477,167, Cl. 354-400.000.
Matsumoto, Toshiaki, 4,477,162, Cl. 354-173.110.
Matsumoto, Toshiaki; and Taniguchi, Nobuyuki, 4,477,163, Cl. 354-173.110.
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Mintz, Leon: *See—*
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Mirenna, Luigi: *See—*
Garlaschelli, Luigi; Gozzo, Franco; Mendillo, Vincenzo; Garavaglia, Carlo; Mirenna, Luigi; and Zagni, Angela, 4,477,461, Cl. 424-272.000.

Mishell, Daniel R.: *See—*
Nakamura, Robert M.; Mishell, Daniel R.; and Stumpf, Paul G., 4,477,577, Cl. 436-510.000.

Mishima, Yoshiaki. Multiple screwdriver. 4,476,751, Cl. 81-440.000.

Misson, John D.: *See—*
Li, Hsin L.; Misson, John D.; and Carrigan, David G., 4,476,753, Cl. 83-36.000.

Mistyurik, John D.: *See—*
Hamisch, Paul H., Jr.; and Mistyurik, John D., 4,477,305, Cl. 156-384.000.

Mita Industrial Company Limited: *See—*
Kozuka, Nobuhiko; Koyama, Shigeo; Kai, Masami; Takahashi, Ichiro; Sakata, Hiromi; and Kano, Atsushi, 4,477,173, Cl. 355-3.0DD.

Mitchell, Michael J., Jr.: *See—*
Klein, Gerhart; and Mitchell, Michael J., Jr., 4,476,624, Cl. 29-623.100.

Mitra, Smarajit, to Minnesota Mining and Manufacturing Company. Polymeric triarylmethane dyes. 4,477,635, Cl. 525-437.000.

Mitsubishi Chemical Industries Ltd.: *See—*
Abe, Masanori; and Tamaura, Yutaka, 4,477,319, Cl. 204-56.00R.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Mori, Teijiro; Masuda, Shigeru; Okado, Hiroyuki; Kakizoe, Masahiro; and Sako, Yuji, 4,477,704, Cl. 200-144.00R.
Ogasahara, Hiroshi; Asai, Osatsugu; and Sato, Takashi, 4,477,689, Cl. 174-15.0CA.
Otani, Hichiro, 4,476,728, Cl. 73-861.220.
Usui, Masaji; and Honma, Akiyoshi, 4,477,854, Cl. 361-36.000.

Mitsubishi Gas Chemical Company, Inc.: *See—*
Tomita, Tetsuo; Jono, Masahiro; and Takata, Toshiaki, 4,477,682, Cl. 568-362.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Akimoto, Ryosaku; Yoshida, Yukio; and Ito, Nobuaki, 4,476,919, Cl. 165-28.000.

Mitsubishi Paper Mills, Ltd.: *See—*
Yamada, Jun; Senga, Takao; and Suzuki, Shigeyoshi, 4,477,547, Cl. 430-14.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Ohe, Makoto; and Sugi, Koichiro, 4,477,303, Cl. 156-230.000.

Mitsui Engineering & Shipbuilding Co., Ltd.: *See—*
Komoto, Mikihisa; and Nakamura, Masatoshi, 4,476,948, Cl. 180-7.200.

Mitsui Petrochemical Industries, Ltd.: *See—*
Koga, Hitoshi, 4,477,513, Cl. 428-246.000.

Mittelsteadt, Robert A., to Control Data Corporation. Combination microwave/convection and broiling oven. 4,477,706, Cl. 219-0.55B.

Mitterbacher, Paul: *See—*
Schoening, Josef; Schwiers, Hans-Georg; and Mitterbacher, Paul, 4,477,409, Cl. 376-296.000.

Mitutoyo Mfg. Co., Ltd.: *See—*
Yamamoto, Takeshi; and Nakahara, Masao, 4,476,634, Cl. 33-178.00R.

Miura, Kazuhiko: *See—*
Hattori, Tadashi; Ozaki, Tadashi; Miura, Kazuhiko; and Ootsuka, Yoshinori, 4,476,709, Cl. 73-35.000.

Miyai, Masahiko: *See—*
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Miyako, Haruyoshi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Recording media selecting mechanism. 4,477,889, Cl. 369-35.000.

Mizuno, Katsuyoshi; and Ihara, Akira, to Nidek Co., Ltd. Photocoagulator. 4,477,139, Cl. 351-221.000.

Mlynek, Daniel: *See—*
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Moan, Richard D., to Ford Motor Company. Control system for an automatic transmission having a neutral coast and idle feature. 4,476,745, Cl. 74-866.000.

Mobay Chemical Corporation: *See—*
Krishnan, Sivaram, 4,477,637, Cl. 525-469.000.
Liang, Tai-Ming; and Spitler, Keith G., 4,477,602, Cl. 521-137.000.

Mobil Oil Corporation: *See—*
Kaeding, Warren W., 4,477,584, Cl. 302-77.000.
Kaeding, Warren W., 4,477,585, Cl. 502-77.000.
Kresge, Charles T.; Krishnamurthy, Sowmithri; and McHale, William D., 4,477,590, Cl. 502-334.000.
Miale, Joseph N., 4,477,582, Cl. 502-26.000.
Reimann, George J.; Benoit, Gordon L.; Gavin, James R.; and Schneider, Michael A., 4,476,979, Cl. 206-554.000.
Riggs, James B., 4,476,927, Cl. 166-261.000.
Rodewald, Paul G., 4,477,583, Cl. 502-71.000.

Mobley, David P., to General Electric Company. Two-stage continuous process for preparation of polyphenylene oxides. 4,477,649, Cl. 528-212.000.

Mobley, David P., to General Electric Company. Process for polyphenylene oxide preparation including catalyst pre-mixing. 4,477,650, Cl. 528-215.000.

Mochida, Haruo; Shimizu, Keiichi; and Namazue, Hirotoshi, to Nissan Motor Company, Limited; and Kokusan Kinzoku Kogyo Co. Ltd. Mischief preventive electronic lock device. 4,477,806, Cl. 340-825.320.

Molinder, Lars A. Underwater cutting tool. 4,477,060, Cl. 266-48.000.

Molins Machine Company, Inc.: *See—*
Coburn, Robert E., 4,476,758, Cl. 83-479.000.

Mollison, Alistair N.: *See—*
Hetherington, Brian L.; Gray, Peter H.; and Mollison, Alistair N., 4,477,407, Cl. 264-288.400.

Monacelli, Walter J.: *See—*
D'Alelio, Gaetano F., deceased, 4,477,439, Cl. 424-162.000.

Monaco, Robin. Defensive reaction football blocking device. 4,477,076, Cl. 273-55.00R.

Monarch Marking Systems, Inc.: *See—*
Hamisch, Paul H., Jr.; and Mistyurik, John D., 4,477,305, Cl. 156-384.000.

Monogram Industries, Inc.: *See—*
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Monroe, James R.: *See—*
Kubacki, Edward F.; Jacobs, Edward C.; Masciale, John M.; and Monroe, James R., 4,476,781, Cl. 101-3.00R.

Monsanto Company: *See—*
Chan, Albert S., 4,477,685, Cl. 568-462.000.
Ledent, Michel A. O.; and May, Bronislav H., 4,477,390, Cl. 260-502.50E.

Montedison S.p.A.: *See—*
Danesi, Sergio; Forti, Sergio; and Manica, Michele, 4,477,631, Cl. 525-133.000.
Garlaschelli, Luigi; Gozzo, Franco; Mendillo, Vincenzo; Garavaglia, Carlo; Mirenna, Luigi; and Zagni, Angela, 4,477,461, Cl. 424-272.000.

Monteyne, Guido. Metalurigical slag filtering apparatus. 4,477,349, Cl. 210-297.000.

Mooney, Donald G.; and Ceshkovsky, Ludwig, to Discovision Associates. Mapping disc defect detector. 4,477,890, Cl. 369-53.000.

Moore, Franklin, Jr.; and Fultz, Clinton. Retainer and dispenser for food containers in fast food establishment. 4,476,996, Cl. 221-61.000.

Moore, L. Dow: *See—*
Das, Balbhadra; and Moore, L. Dow, 4,477,496, Cl. 427-375.000.

Mora, Camillo C., to Camillo Corvi S.p.A. Thiazolidine derivatives and their mucolytic compositions and methods. 4,477,458, Cl. 424-266.000.

Morello, Edward B.: *See—*
Bailey, Larry E.; and Morello, Edward B., 4,477,504, Cl. 428-138.000.

Morgan, Richard B.: *See—*
McWhirter, Ian; and Morgan, Richard B., 4,477,848, Cl. 360-60.000.

Mori, Kei. Sunlight collecting and concentrating apparatus. 4,477,145, Cl. 350-96.100.

Mori, Kinji: *See—*
Kobayashi, Nobuhisa; Mori, Kinji; Ihara, Hirokazu; and Ikeda, Katuaki, 4,477,881, Cl. 364-900.000.

Mori, Teijiro; Masuda, Shigeru; Okado, Hiroyuki; Kakizoe, Masahiro; and Sako, Yuji, to Mitsubishi Denki Kabushiki Kaisha. Power switching device. 4,477,704, Cl. 200-144.00R.

Morichika, Toshiaki: *See*—
Mihara, Takao; Morichika, Toshiaki; and Sone, Shigenori, 4,477,711, Cl. 219-121.0PJ.

Moriguchi, Fujio, to Fuji Xerox Co., Ltd. Stepping motor exciting system. 4,477,756, Cl. 318-696.000.

Moriguchi, Haruhiko; and Inui, Toshiharu, to Fuji Xerox Co., Ltd. Method of driving a thermal head. 4,477,820, Cl. 346-76.0PH.

Morin, Jean: *See*—
Fecan, Jean C.; and Morin, Jean, 4,477,415, Cl. 422-164.000.

Morino, Toshiharu: *See*—
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,477,392, Cl. 261-39.00A.

Morita, Yoshiyuki: *See*—
Nakamura, Kohichi; and Morita, Yoshiyuki, 4,477,877, Cl. 364-571.000.

Moritz, Bertil, to Asea Aktiebolag. Electrical inductive apparatus with cooling channels. 4,477,790, Cl. 336-60.000.

Moriya, Isao: *See*—
Henmi, Shoichi; Imura, Junichi; and Moriya, Isao, 4,477,795, Cl. 338-163.000.

Morrill, Charles D., to Smith International, Inc. Flowline connector seal. 4,476,897, Cl. 137-594.000.

Morrill, Charles D.; and Best, Michael J. A., to Smith International, Inc. Apparatus for connecting underwater flow line hubs. 4,477,205, Cl. 405-169.000.

Morrill, Charles D.: *See*—
Hynes, Joseph H.; and Morrill, Charles D., 4,476,935, Cl. 166-373.000.

Morris, David S., to Shopsmith, Inc. Adjustable featherboard. 4,476,757, Cl. 83-446.000.

Morrison, Bert L.: *See*—
Bridges, Charles D.; Karr, Michael A., Jr.; and Morrison, Bert L., 4,477,085, Cl. 277-22.000.

Morrison, Edward D.: *See*—
Harasta, Louis P.; Leszyk, Gerald M.; and Morrison, Edward D., 4,477,548, Cl. 430-14.000.

Morscheck, Timothy J., to Eaton Corporation. Preselect shift control. 4,476,748, Cl. 74-867.000.

Mortlock, Clarence E.; Brady, Joseph A.; and Shapiro, Marvin, to United States of America, Navy. Dynamic skew correction for multichannel analog recording. 4,477,845, Cl. 360-26.000.

Mosch, Franz: *See*—
Deiner, Hans; Mosch, Franz; Sandner, Bernhard; and Bernheim, Willy, 4,477,498, Cl. 427-389.900.

Moser, Jessie L.; and West, John D., to AMP Incorporated. Connector for twin axial cable. 4,477,132, Cl. 339-14.00P.

Moser, John J., Jr., to International Business Machines Corporation. Dynamic output impedance for 3-state drivers. 4,477,741, Cl. 307-473.000.

Moss, Donald. Corn pickup attachment for a combine. 4,476,667, Cl. 56-119.000.

Mostek Corporation: *See*—
Proebsting, Robert J.; and Schroeder, Paul R., 4,477,739, Cl. 307-449.000.

Motorola, Inc.: *See*—
Borras, Jaime A.; and Gonzalez, Ruben J., 4,477,919, Cl. 377-47.000.
Keshlear William M., 4,477,871, Cl. 364-200.000.
Pronto, Stephen R., 4,477,135, Cl. 339-14.00R.
Ulmer, Richard W.; and Whatley, Roger A., 4,477,737, Cl. 307-297.000.

Motsinger, Donald L.: *See*—
Brown, Daniel G.; and Motsinger, Donald L., 4,477,524, Cl. 428-391.000.

Mott, Joseph J. Disposable lid for pots, pans and like receptacles. 4,477,509, Cl. 428-198.000.

Mowry, Charles F.: *See*—
Conklin, Michael T.; and Mowry, Charles F., 4,476,687, Cl. 62-64.000.

MTD Products Limited: *See*—
Hilchey, Robert M.; and Fors, Arne L., 4,476,643, Cl. 37-245.000.

Mukae, Kazuo; Maruyama, Satoshi; Tsuda, Koichi; and Nagasawa, Ikuo, to Fuji Electric Co., Ltd.; and Fuji Electric Corporate Research and Development, Ltd. Zinc oxide non-linear resistor. 4,477,793, Cl. 338-21.000.

Mukai, Yasuteru: *See*—
Otake, Katsumoto; Miyai, Masahiko; Sasaki, Takuya; Mukai, Yasuteru; Takahashi, Sankichi; and Okouchi, Isao, 4,476,917, Cl. 165-1.000.

Mulas, Piero; and Bonissone, Giancarlo. Multi-component valve. 4,476,891, Cl. 137-270.000.

Muller, Frank: *See*—
Buck, Manfred; Muller, Frank; and Wanner, Karl, 4,476,941, Cl. 173-117.000.

Mullhaupt, Joseph T.; and Berwaldt, Oren E., to Union Carbide Corporation. Process for adsorption. 4,477,418, Cl. 423-219.000.

Multifastener Corporation: *See*—
Steward, John H.; and Ladouceur, Harold A., 4,476,599, Cl. 10-139.0WH.

Murakami, Katsumi: *See*—
Furuichi, Katsushi; Yokomizo, Yoshikazu; Honma, Toshio; and Murakami, Katsumi, 4,477,178, Cl. 355-14.00R.

Murakami, Shohachi: *See*—
Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,664, Cl. 544-360.000.
Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,666, Cl. 544-385.000.
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,477,437, Cl. 424-116.000.

Muramatsu, Hiromochi; Watanabe, Atsushi; and Hara, Kunihiko, to Nippondenso Co., Ltd. Process for forming an electrode of an organic cell. 4,477,485, Cl. 427-38.000.

Muramoto, Takayoshi; Nishino, Shingi; Sasaki, Toshiyuki; and Sasaki, Takanori, to Fumakilla Limited. Evaporative container. 4,477,414, Cl. 422-125.000.

Murase, Shigemitsu: *See*—
Kudo, Kazushige; Yamamoto, Shigeo; and Murase, Shigemitsu, 4,477,497, Cl. 427-386.000.

Murata Manufacturing Co., Ltd.: *See*—
Azuchi, Yukihiro, 4,477,859, Cl. 361-278.000.
Nishioka, Goro; Komatsu, Hiroshi; and Sakabe, Yukio, 4,477,581, Cl. 501-137.000.

Murata, Mitsuhiro: *See*—
Saitoh, Mitsuo; Kamiyama, Yasuo; and Murata, Mitsuhiro, 4,477,195, Cl. 368-88.000.

Murayama, Fumiaki: *See*—
Enomoto, Nizo; and Murayama, Fumiaki, 4,476,836, Cl. 123-502.000.

Muroi, Soichi; Seta, Shigetoshi; Matsumoto, Yoshio; Yasui, Koichi; and Imamura, Kazuyoshi. Hot-melt adhesive and method. 4,477,636, Cl. 525-444.000.

Murphy, Charles V., to Du Pont de Nemours, E. I., and Company. Molding resins based on blends of acid copolymer/hydrocarbon polyolefin/reinforcing fiber/wetting agent. 4,477,617, Cl. 524-136.000.

Murphy, Jack L. Mud metering tank monitoring system. 4,476,715, Cl. 73-151.000.

Murphy, James W. Latching mechanism. 4,476,750, Cl. 81-300.000.

Murphy, Richard F. Scanning gauge apparatus. 4,476,717, Cl. 73-159.000.

Murray, James A.; and Nyman, David, to International Standard Electric Corporation. Adaptive equalizer. 4,477,914, Cl. 375-14.000.

Murray, Robert G.: *See*—
Koppelman, Edward; and Murray, Robert G., 4,477,257, Cl. 44-30.000.

Myers, Jimmy, to Dow Chemical Company, The. Piperazinoethyl ureas. 4,477,646, Cl. 528-118.000.

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Kojima, Takao; and Naganuma, Naoto, 4,477,487, Cl. 427-123.000.

Nagasawa, Ikuo: *See*—
Mukae, Kazuo; Maruyama, Satoshi; Tsuda, Koichi; and Nagasawa, Ikuo, 4,477,793, Cl. 338-21.000.

Nagata, Masayoshi: *See*—
Horie, Seiji; Nagata, Masayoshi; Nakano, Junji; and Sato, Hideo, 4,477,550, Cl. 430-59.000.

Nagel, Gregory L.: *See*—
Cleveland, Dixon; Havens, James R.; Nagel, Gregory L.; Decina, Basil A., Jr.; and Jenuwine, William C., 4,477,709, Cl. 219-109.000.

Nagumo, George; Miller, Donald A.; and Lieberman, Paul, to United States of America, Army. Microwave system for particle and shock velocity measurement in a geological type material. 4,477,888, Cl. 367-152.000.

Nagy, Jozsef: *See*—
Pasztor, Emil; Lazar, Laszlo ; Nagy, Jozsef; and Pallosy nee Becker, Katalin, 4,477,255, Cl. 604-97.000.

Nagy, Louis L.; Eddy, David S.; and O'Rourke, Michael J., to General Motors Corporation. Microwave detection of soot content in a particulate trap. 4,477,771, Cl. 324-58.50C.

Nair, Kumaran M., to Du Pont de Nemours, E. I., and Company. Method for activating metal particles. 4,477,296, Cl. 148-6.14R.

Nakagawa, Isamu: *See*—
Saito, Teruo; Asai, Kuniaki; Nakagawa, Isamu; and Kobayashi, Tadayasu, 4,477,630, Cl. 525-133.000.

Nakagiri, Tadahiko, to Citizen Watch Company Limited. Data input device for electronic device. 4,477,797, Cl. 340-365.00S.

Nakahara, Masao: *See*—
Yamamoto, Takeshi; and Nakahara, Masao, 4,476,634, Cl. 33-178.00R.

Nakahara, Yutaka: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Shibata, Toshihiro, 4,477,616, Cl. 524-102.000.

Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Camera system operable in accordance with stored memory. 4,477,164, Cl. 354-286.000.

Nakajima, Takashi; and Suzuki, Makoto, to TDK Corporation. Thermoelectric element. 4,477,686, Cl. 136-203.000.

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Watanabe, Nobuaisu; Nakajima, Tsuyoshi; and Kawaguchi, Masayuki, 4,477,374, Cl. 252-508.000.

Nakamura, Akira: *See*—
Ukai, Nobuo; Kawano, Nagahiro; Toyofuku, Yasumasa; and Nakamura, Akira, 4,476,670, Cl. 56-328.00R.

Nakamura, Kohichi; and Morita, Yoshiyuki, to Seiko Instruments & Electronics Ltd. Coordinate determining device. 4,477,877, Cl. 364-571.000.

Nakamura, Masatoshi: *See*—
Komoto, Mikihisa; and Nakamura, Masatoshi, 4,476,948, Cl. 180-7.200.

Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, to Toyota Jidosha Kabushiki Kaisha; and Aisan Industry Co., Ltd. Variable venturi-type carburetor. 4,477,392, Cl. 261-39.00A.

Nakamura, Robert M.; Mishell, Daniel R.; and Stumpf, Paul G., to University of Southern California. Non-contaminating direct serum assay of steroid hormones. 4,477,577, Cl. 436-510.000.

Nakano, Hiromitsu; and Yoshida, Isao, to Matsushita Electric Industrial Co., Ltd. Speed control apparatus for DC motor. 4,477,752, Cl. 318-331.000.

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Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,664, Cl. 544-360.000.
Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,666, Cl. 544-385.000.

Nakano, Junji: *See*—
Horie, Seiji; Nagata, Masayoshi; Nakano, Junji; and Sato, Hideo, 4,477,550, Cl. 430-59.000.

Nakano, Kenji; Machida, Yukihiko; and Odaka, Kentaro, to Sony Corporation. Apparatus for recording a digital audio signal in a track with a video signal. 4,477,844, Cl. 360-8.000.

Nakaya, Seiichi: *See*—
Isogai, Jun; Nakaya, Seiichi; Saitou, Akira; Takahashi, Akio; and Yagi, Isao, 4,477,284, Cl. 106-104.000.

Nakayama, Keizo; and Seo, Kazuo, to Hitachi, Ltd. Protecting system for transmission lines. 4,477,855, Cl. 361-54.000.

Nakazato, Kazuo, to Fuji Jukogyo Kabushiki Kaisha; and Nissan Motor Company, Limited. Air-fuel ratio control system. 4,476,834, Cl. 123-440.000.

Nalco Chemical Company: *See*—
Reven, Frederick V., 4,477,579, Cl. 501-1.000.

Namazue, Hirotoshi: *See*—
Mochida, Haruo; Shimizu, Keiichi; and Namazue, Hirotoshi, 4,477,806, Cl. 340-825.320.

NATEC Institut: *See*—
Seidel, Hartmut; and Hammerschmidt, Winrich B., 4,476,600, Cl. 12-142.00V.

National Distillers and Chemical Corporation: *See*—
Beimesch, Bruce J.; Schnur, Nicholas E.; and Hughes, Clarence J., Jr., 4,477,383, Cl. 260-410.600.
Biggs, James W.; and Maringer, Melvin F., 4,477,523, Cl. 428-389.000.

National Research Development Corporation: *See*—
Scales, John T.; and Wilkinson, Michael J., 4,476,590, Cl. 3-1.910.
Singer, Alfred R. E., 4,477,291, Cl. 148-11.50Q.

National Semiconductor Corporation: *See*—
Yaron, Giora; Shum, Ying K.; Priel, Ury; Prasad, Jayasimha S.; and Ebel, Mark S., 4,477,825, Cl. 357-23.500.

National Starch and Chemical Corporation: *See*—
Fernandez, Julio A., 4,477,282, Cl. 106-34.000.

Nauman, John D., to Allegheny Ludlum Steel Corporation. Annular tuyere and method. 4,477,279, Cl. 75-60.000.

NCR Corporation: *See*—
Avery, James M.; and Hoyer, Elmer A., 4,477,925, Cl. 381-43.000.

Nebe, William J.: *See*—
Dueber, Thomas E.; and Nebe, William J., 4,477,556, Cl. 430-281.000.

Neesz, John J.: *See*—
Collins, David W.; Neesz, John J.; and Stich, Michael C., 4,477,750, Cl. 318-270.000.

Nelson, James W.; and Wente, Steven R., to Snap-on Tools Corporation. Chuck key holder for a power tool. 4,477,213, Cl. 408-241.00R.

Nemeni, Tibor M.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Turutin, Veniamin S.; Bezchastnov, Gennady A.; and Telezhnikov, Jury F., 4,477,690, Cl. 174-15.00C.

Neumann, Juergen, to Hoechst Aktiengesellschaft. Device for the repetitive copying of originals in a copier. 4,477,181, Cl. 355-3.0SH.

New York Institute of Technology: *See*—
Glenn, William E., 4,477,783, Cl. 333-138.000.

Newell, Harry L., Jr.: *See*—
Stables, Wilbur L.; Cooksey, James J.; and Newell, Harry L., Jr., 4,476,729, Cl. 73-861.610.

Newman Machine Company, Inc.: *See*—
Crawford, William B.; and Barber, Brian D., 4,476,906, Cl. 144-116.000.

NGK Spark Plug Co., Ltd.: *See*—
Kojima, Takao; and Naganuma, Naoto, 4,477,487, Cl. 427-123.000.

Nibert, Roger K.: *See*—
Okubo, Howard S.; Albertson, Clarence E.; and Nibert, Roger K., 4,477,605, Cl. 523-155.000.

Niblett, Norman C. Fuel pre-heater. 4,476,839, Cl. 123-557.000.

Nichias Corporation: *See*—
Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, 4,477,094, Cl. 277-235.00B.

Nicolet Zeta: *See*—
Luoma, Thomas; and Rutherford, Alan, 4,477,822, Cl. 346-136.000.

Nidek Co., Ltd.: *See*—
Mizuno, Katsuyoshi; and Ihara, Akira, 4,477,159, Cl. 351-221.000.

Nielsen, Povl H., to Radiometer A/S. Electrochemical electrode device. 4,477,330, Cl. 204-414.000.

Nielsen, Robert P., to Shell Oil Company. Olefin polymerization catalyst component and composition and method of preparation. 4,477,639, Cl. 526-124.000.

Nijhawan, Pramodh; and Schaltenbrand, Eugene D., to Bahnson Company, The. Fumes control system for electric arc furnaces. 4,477,910, Cl. 373-9.000.

Nijman, Aloysius J.: *See*—
van den Enden, Adrianus W. M.; van Mil, Job F. P.; and Nijman, Aloysius J., 4,477,696, Cl. 179-18.0BC.

Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Turutin, Veniamin S.; Bezchastnov, Gennady A.; and Telezhnikov, Jury F. Coupling unit of two multilayer cables of high-voltage generator stator winding. 4,477,690, Cl. 174-15.00C.

Nikolsky, Alexandr I.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Turutin, Veniamin S.; Bezchastnov, Gennady A.; and Telezhnikov, Jury F., 4,477,690, Cl. 174-15.00C.

Nilsson, Gert E.; Tenland, Jan T.; and Oberg, Per A. Method and apparatus for measuring flow motions in a fluid. 4,476,875, Cl. 128-666.000.

Nilsson, Rolf; and Lindstrom, Nils-Georg, to Tunamatic Handelsbolag. Arrangement for coupling an implement to a tractor. 4,477,101, Cl. 280-461.00A.

Nippe, Burkhard: *See*—
Kohler, Robert; Nippe, Burkhard; Kober, Heinrich; Schilffarth, Karichristian; Meckel, Walter; and Quiring, Bernd, 4,477,531, Cl. 428-425.900.

Nippon Electric Co., Ltd.: *See*—
Ichikawa, Yoshio, 4,477,808, Cl. 340-825.440.
Nakajima, Takeshi; and Ohyagi, Takashi, 4,477,807, Cl. 340-825.440.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Kumano, Shinji, 4,476,769, Cl. 84-434.000.
Nishimoto, Tetsuo, 4,476,764, Cl. 84-1.030.

Nippon Kogaku K.K.: *See*—
Terui, Nobuhiko; Watanabe, Sakuji; and Meguro, Hiroshi, 4,477,169, Cl. 354-409.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Sano, Shigeru; Sakurai, Katsumi; Ono, Tatsuo; Tsuruoka, Kanji; and Watanabe, Masaru, 4,477,708, Cl. 219-10.670.

Nippon Seiko K.K.: *See*—
Yamaguchi, Mikio, 4,476,741, Cl. 74-493.000.

Nippon Soken, Inc.: *See*—
Hattori, Tadashi; Ozaki, Tadashi; Miura, Kazuhiko; and Ootsuka, Yoshinori, 4,476,709, Cl. 73-35.000.
Tanaka, Hiroaki; and Akita, Shigeyuki, 4,477,810, Cl. 340-870.370.

Nippon Steel Corporation: *See*—
Higuchi, Seizun; Tano, Kazuhiro; Kamada, Minoru; and Okamoto, Susumu, 4,476,805, Cl. 118-65.000.
Sakai, Kango; Yoshihara, Ryoichi; Sakurai, Hiroshi; and Minamida, Katsuhiro, 4,477,316, Cl. 204-290.00F.

Nippondenso Co., Ltd.: *See*—
Akita, Yoshio; Teshima, Takanori; Torii, Koshi; and Maruyama, Toshinori, 4,477,766, Cl. 322-28.000.
Enomoto, Nizo; and Murayama, Fumiaki, 4,476,836, Cl. 123-502.000.
Ikuta, Hiroshi; and Kato, Takaaki, 4,477,874, Cl. 364-424.000.
Muramatsu, Hiromochi; Watanabe, Atsushi; and Hara, Kunihiko, 4,477,485, Cl. 427-38.000.
Nishi, Yasuyuki; Takagi, Masasi; and Sakurai, Masao, 4,476,692, Cl. 62-228.500.

Nis, John R.; and Spainhour, Carroll D., to AT&T Technologies, Inc. Torch. 4,477,244, Cl. 432-11.000.

Nishi, Yasuyuki; Takagi, Masasi; and Sakurai, Masao, to Nippondenso Co., Ltd. Automotive refrigeration system. 4,476,692, Cl. 62-228.500.

Nishijima, Yoshito: *See*—
Fukuda, Hirokazu; Shinohara, Koji; Kawabata, Yoshio; Nishijima, Yoshito; and Yamamoto, Kosaku, 4,477,730, Cl. 250-504.00R.

Nishikawa, Masayoshi: *See*—
Tosima, Soitiro; and Nishikawa, Masayoshi, 4,477,892, Cl. 369-132.000.

Nishikido, Joji; Kodama, Eiji; and Shibukawa, Mitsuru, to Asahi Kasei Kogyo Kabushiki Kaisha. Cephalosporin compound. 4,477,659, Cl. 544-21.000.

Nishimoto, Kazuo: *See*—
Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, 4,477,094, Cl. 277-235.00B.

Nishimoto, Tetsuo, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic performance apparatus for use in combination with a manually operable musical tone generating instrument. 4,476,764, Cl. 84-1.030.

Nishimura, Masanori: *See*—
Matsuura, Tamiaki; Aiba, Takeshi; Fukushima, Takashi; Nishimura, Masanori; Ohtsuki, Hiroshi; Yabuki, Fujio; and Kusakabe, Tomio, 4,476,627, Cl. 29-791.000.
Nishino, Shigetaka: *See*—
Ueda, Ikuo; Teraji, Tsutomu; Takaya, Takao; Takai, Keiji; Takasugi, Hisashi; Shimojo, Fumio; and Nishino, Shigetaka, 4,477,447, Cl. 424-246.000.
Nishino, Shingi: *See*—
Muramoto, Takayoshi; Nishino, Shingi; Sasaki, Toshiyuki; and Sasaki, Takanori, 4,477,414, Cl. 422-125.000.
Nishioka, Goro; Komatsu, Hiroshi; and Sakabe, Yukio, to Murata Manufacturing Co., Ltd. High permittivity ceramic compositions. 4,477,581, Cl. 501-137.000.
Nishizawa, Kazunori; and Kato, Haruya, to Kao Soap Co., Ltd. Insect repellent. 4,477,467, Cl. 424-317.000.
Nishu, Mitsufumi: *See*—
Ida, Shuichiro; Ooshima, Shoichi; Horiuchi, Ichiro; and Nishu, Mitsufumi, 4,476,740, Cl. 74-476.000.
Niskanen, Toivo; and Fellman, Raimo, to Kamyr AB. Affixation of a pump to a tank. 4,476,886, Cl. 137-15.000.
Nissan Motor Company, Limited: *See*—
Asakura, Noboru; Yanagawa, Motoo; and Tsugahara, Takatoshi, 4,477,115, Cl. 296-1.00S.
Endo, Hiroshi, 4,477,184, Cl. 356-141.000.
Hiraiwa, Kazuyoshi, 4,476,953, Cl. 180-249.000.
Kawaura, Takayoshi; Kan, Hiroyasu; and Kyoi, Yuji, 4,477,061, Cl. 267-8.00R.
Mochida, Haruo; Shimizu, Keiichi; and Namazue, Hirotoshi, 4,477,806, Cl. 340-825.320.
Nakazato, Kazuo, 4,476,834, Cl. 123-440.000.
Suzuki, Kunihiko, 4,476,952, Cl. 180-247.000.
Nissin Jabara Industries Co., Ltd.: *See*—
Fukumoto, Masafumi, 4,476,838, Cl. 123-556.000.
Nissin Oil Mills, Ltd.: *See*—
Seto, Akiro; Sakai, Muneo; and Sakita, Takashi, 4,477,472, Cl. 426-98.000.
Nitigus, Victor: *See*—
Apetrei, Constantin; Nitigus, Victor; Demeter, Elek; Radulescu, Marian; and Sachelarie, Toma, 4,477,743, Cl. 310-77.000.
Nitta, Jun: *See*—
Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,664, Cl. 544-360.000.
Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,666, Cl. 544-385.000.
Nixon, John. Engine compartment structure. 4,476,820, Cl. 123-41.050.
Noji, Masahide: *See*—
Kidani, Yoshinori; and Noji, Masahide, 4,477,387, Cl. 260-429.00R.
Nolan, Robert L., to Maxcap, Inc. Bottle caps. 4,476,987, Cl. 215-319.000.
Nomori, Hiroyuki: *See*—
Fujimaki, Yoshihide; Takei, Yoshiaki; and Nomori, Hiroyuki, 4,477,549, Cl. 430-54.000.
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Omata, Yuji, to Matsushita Electric Industrial Co., Ltd. Magnetoresistive element. 4,477,794, Cl. 338-32.00R.
Noorlander, Willem: *See*—
Hagemann, Hans J.; Hunten, Siegfried; Wernicke, Rolf; Klomp, Cornelius J.; and Noorlander, Willem, 4,477,401, Cl. 264-61.000.
Norberg, Richard A.; and Selin, Ronald L., to Rockford Products Corporation. Screw and bolt tray displayer. 4,476,985, Cl. 211-126.000.
Nordica S.p.A.: *See*—
Aldinio, Giuseppe; and Baggio, Giorgio, 4,476,640, Cl. 36-121.000.
Nordischer Maschinenbau Rud. Baader GmbH and Co. KG: *See*—
Wenzel, Werner, 4,476,610, Cl. 17-55.000.
Northern Telecom Limited: *See*—
Walker, John C.; and Thumm, Manfred, 4,477,827, Cl. 357-70.000.
Nossen, Steve J.; Brokl, Stanley S.; and McGuire, Kenyon E. B., to RCA Corporation. Multiple synchronous counters with ripple read. 4,477,918, Cl. 377-37.000.
Novatome: *See*—
Debru, Michel, 4,477,410, Cl. 376-404.000.
Nozaki, Tadashi: *See*—
Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, 4,476,739, Cl. 74-475.000.
Haga, Shozi; and Nozaki, Tadashi, 4,476,738, Cl. 74-475.000.
Nunn, Timothy A.: *See*—
Kurtz, Anthony D.; Mallon, Joseph R.; and Nunn, Timothy A., 4,476,726, Cl. 73-708.000.
Nusbaum, Henry J. Method of casting metal matrix composite in ceramic shell mold. 4,476,916, Cl. 164-519.000.
Nye, Susan A.: *See*—
White, Dwain M.; and Nye, Susan A., 4,477,651, Cl. 528-215.000.
Nygaard, Richard A., Jr., to Hewlett-Packard Company. Variable resolution counter. 4,477,920, Cl. 377-52.000.
Nyman, David: *See*—
Murray, James A.; and Nyman, David, 4,477,914, Cl. 375-14.000.
O&K Orenstein & Koppel Aktiengesellschaft: *See*—
Schoneweiss, Klaus, 4,476,971, Cl. 198-323.000.
O.S. Equipment Inc.: *See*—
Sauder, Charles J., 4,477,219, Cl. 414-126.000.
Oba, Hideaki; Kunikane, Makoto; Umehara, Masaakira; Tanikawa, Kiyoshi; and Abe, Michiharu, to Ricoh Co., Ltd. Optical information recording medium. 4,477,555, Cl. 430-273.000.
Oberdorf, Manfred, to Maschinenfabrik Alfred Schmermund GmbH & Co. Packaging machine. 4,476,665, Cl. 53-575.000.
Oberg, Per A.: *See*—
Nilsson, Gert E.; Tenland, Jan T.; and Oberg, Per A., 4,476,875, Cl. 128-666.000.
Obersteiner, Georg: *See*—
Belart, Juan; Kircher, Dieter; Budecker, Ludwig; and Obersteiner, Georg, 4,477,125, Cl. 303-116.000.
O'Brien, Thomas E., to General Instrument Corporation. Security system. 4,477,800, Cl. 340-533.000.
Occidental Chemical Corporation: *See*—
Colaruotolo, Joseph F.; Olsen, Ronald H.; and Vandenbergh, Peter A., 4,477,570, Cl. 435-253.000.
Oce-Nederland B.V.: *See*—
Vetjens, Marinus J. P., 4,477,836, Cl. 358-293.000.
O'Connor, Lawrence. Winding a package of tape. 4,477,035, Cl. 242-67.10R.
Oda, Shingo: *See*—
Ito, Tetsuo; and Oda, Shingo, 4,476,904, Cl. 139-452.000.
Odaka, Kentaro: *See*—
Nakano, Kenji; Machida, Yukihiko; and Odaka, Kentaro, 4,477,844, Cl. 360-8.000.
Odani, Kouichiro: *See*—
Mimura, Takashi; Hikosaka, Kohki; and Odani, Kouichiro, 4,477,311, Cl. 156-643.000.
Odawara, Chuichiro. Antiskid device for tire. 4,476,907, Cl. 152-179.000.
Odeyer, Pierre P. L.: *See*—
Aurousseau, Christian; and Odeyer, Pierre P. L., 4,476,675, Cl. 60-39.281.
O'Driscoll, Peter F.; Crowe, Gerald E.; and Berry, John, to United States of America, Air Force. Carbon/carbon rocket motor exit cone reinforcement. 4,477,024, Cl. 239-265.110.
Oechsle, Sixtus J., III. Polyurethane compositions and their use as luting agents. 4,477,604, Cl. 523-116.000.
Ogasahara, Hiroshi; Asai, Osatsugu; and Sato, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Current relaying device used with superconductor apparatus. 4,477,689, Cl. 174-15.0CA.
Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki, to Victor Company of Japan, Ltd. Adapter for a miniature type tape cassette. 4,477,850, Cl. 360-94.000.
Ogawa, Akira; Aoki, Kozo; and Kamio, Takayoshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,477,558, Cl. 430-384.000.
Ogawa, Kimio: *See*—
Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki, 4,477,850, Cl. 360-94.000.
Ohe, Makoto; and Sugi, Koichiro, to Mitsubishi Rayon Co., Ltd. Process for preparation of surface-protecting acrylic film. 4,477,303, Cl. 156-230.000.
Ohio Broach & Machine Company, The: *See*—
Van De Motter, Charles P.; Hamm, Steven J.; and Van De Motter, Christopher C., 4,477,216, Cl. 409-257.000.
Ohki, Yoshimasa; Toyoda, Yukio; Kobayashi, Hiroyuki; and Akasaki, Isamu, to Matsushita Electric Industrial Co., Ltd. Method of making a gallium nitride light-emitting diode. 4,476,620, Cl. 29-569.00L.
Ohtsuki, Hiroshi: *See*—
Matsuura, Tamiaki; Aiba, Takeshi; Fukushima, Takashi; Nishimura, Masanori; Ohtsuki, Hiroshi; Yabuki, Fujio; and Kusakabe, Tomio, 4,476,627, Cl. 29-791.000.
Ohyagi, Takashi: *See*—
Nakajima, Takeshi; and Ohyagi, Takashi, 4,477,807, Cl. 340-825.440.
Oka, Masahiko, to Dainippon Screen Manufacturing Co., Ltd. Washing apparatus. 4,476,601, Cl. 15-21.00D.
Okado, Hiroyuki: *See*—
Mori, Teijiro; Masuda, Shigeru; Okado, Hiroyuki; Kakizoe, Masahiro; and Sako, Yuji, 4,477,704, Cl. 200-144.00R.
Okamoto, Susumu: *See*—
Higuchi, Seizun; Tano, Kazuhiro; Kamada, Minoru; and Okamoto, Susumu, 4,476,805, Cl. 118-65.000.
Okano, Masami: *See*—
Fujimori, Kyoichi; and Okano, Masami, 4,476,832, Cl. 123-502.000.
Okouchi, Isao: *See*—
Otake, Katsumoto; Miyai, Masahiko; Sasaki, Takuya; Mukai, Yasuteru; Takahashi, Sankichi; and Okouchi, Isao, 4,476,917, Cl. 165-1.000.
Okubo, Howard S.; Albertson, Clarence E.; and Nibert, Roger K., to Borg-Warner Corporation. Asbestos-free friction materials. 4,477,605, Cl. 523-155.000.
Okura, Zenichi: *See*—
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O'Lenick, Anthony J., to Henkel Corporation. Anionic nonionic surfactant mixture. 4,477,372, Cl. 252-545.000.
Oley, Nicholas R., to Westinghouse Brake & Signal Co. Ltd. Arrangement for aligning and attaching a shim to a semiconductor element. 4,477,826, Cl. 357-68.000.
Olin Corporation: *See*—
Winter, Joseph; and Pryor, Michael J., 4,477,147, Cl. 350-96.230.
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Leuner, Hilmar; Dobhan, Herbert; Bauer, Bernhard; and Olschewski, Armin, 4,476,913, Cl. 164-346.000.

Olsen, Ronald H.: *See*—
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Olszewski, Witold; Lis, Andrzej; Pietraszek, Pawel; and Tuznik, Franciszek S., to Instytut Mechaniki Precyzyjnej. Device for clarification of liquids and separation of precipitates. 4,477,344, Cl. 210-109.000.
Olympus Optical Co., Ltd.: *See*—
Kanayama, Katsumi, 4,477,751, Cl. 318-280.000.
O'Malley, William P.: *See*—
Greenwald, Edward H., Sr.; O'Malley, William P.; and Rogers, Ross, Jr., 4,477,220, Cl. 414-139.000.
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Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Omata, Yuji, 4,477,794, Cl. 338-32.00R.
OMI International Corporation: *See*—
Tomaszewski, Thaddeus W., 4,477,315, Cl. 204-1.500.
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Omori, Hiroshi: *See*—
Anahara, Meiji; Seiki, Kazuo; and Omori, Hiroshi, 4,476,672, Cl. 57-333.000.
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Ong, Helen H.; and Profitt, James A., to American Hoechst Corporation. Spiro[indoline-3,4'-piperidine]s and related compounds. 4,477,667, Cl. 546-17.000.
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Sano, Shigeru; Sakurai, Katsumi; Ono, Tatsuo; Tsuruoka, Kanji; and Watanabe, Masaru, 4,477,708, Cl. 219-10.670.
Onton, Aare: *See*—
Lee, Michael H.; Onton, Aare; and Wieder, Harold, 4,477,819, Cl. 346-76.00L.
Ooshima, Shoichi: *See*—
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Ootsuka, Yoshinori: *See*—
Hattori, Tadashi; Ozaki, Tadashi; Miura, Kazuhiko; and Ootsuka, Yoshinori, 4,476,709, Cl. 73-35.000.
Optical Technologies, Inc.: *See*—
Carome, Edward F.; and Davis, Charles M., 4,477,723, Cl. 250-227.000.
Optimum Space Systems: *See*—
Reppas, George S.; and Drexhage, Gerrit K., 4,476,592, Cl. 5-164.00B.
Orlando, Fred J., Jr.: *See*—
Casper, Paul W.; Toy, James W.; Orlando, Fred J., Jr.; and Giri, Ronald R., 4,477,895, Cl. 370-16.000.
O'Rourke, Michael J.: *See*—
Nagy, Louis L.; Eddy, David S.; and O'Rourke, Michael J., 4,477,771, Cl. 324-58.50C.
Orozovich, George E.: *See*—
Seidel, William C.; Orozovich, George E.; and Medcalf, Darrell G., 4,477,480, Cl. 426-578.000.
Ory, Harry J. Unitary window safety bars and exterior fire escape ladder. 4,476,957, Cl. 182-21.000.
OSA AB: *See*—
Hedin, Jan Erik, 4,476,755, Cl. 83-364.000.
Osburn, Frank G., to Hollister Incorporated. Skin barrier composition comprising an irradiated crosslinked ethylene-vinyl acetate copolymer and polyisobutylene. 4,477,325, Cl. 204-159.120.
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Castelbaum, Leonard; Ostrowski, Joseph M.; and Bedson, Joseph H., Jr., 4,477,108, Cl. 285-149.000.
O'Sullivan, Eileen F., to American Can Company. Plastic sheet having high gloss and low coefficient of friction and method for producing the same. 4,477,502, Cl. 428-35.000.
Oswald, Heinz, to Rieter Machine Works, Ltd. Thread catching structure. 4,477,034, Cl. 242-18.0PW.
Ota, Chuichi; Imamura, Nobutake; and Tanaka, Shinsuke, to Kokusai Denshin Denwa Kabushiki Kaisha. Magneto-optical recording and reproducing system. 4,477,852, Cl. 360-114.000.
Ota, Yozo: *See*—
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Otake, Katsumoto; Miyai, Masahiko; Sasaki, Takuya; Mukai, Yasuteru; Takahashi, Sankichi; and Okouchi, Isao, to Hitachi, Ltd. Method of and system for cleaning cooling tubes of heat transfer units. 4,476,917, Cl. 165-1.000.
Otani, Hichiro, to Mitsubishi Denki Kabushiki Kaisha. Vortex flow meter. 4,476,728, Cl. 73-861.220.
Otsu, Takayuki; and Kojima, Hirosuke, to Hirosuke Kojima. Method of preparing a low density, nonflammable polyvinyl foam composition. 4,477,599, Cl. 521-89.000.
Otsuka Chemical Co., Ltd.: *See*—
Kidani, Yoshinori; and Noji, Masahide, 4,477,387, Cl. 260-429.00R.
Otte, Ernst A. W.: *See*—
Bauer, Hartmut K.; and Otte, Ernst A. W., 4,477,420, Cl. 423-234.000.
Outboard Marine Corporation: *See*—
Broman, Donald E., 4,476,964, Cl. 188-109.000.
Outman, J. Frederich L. Player worn ball retrieval/training device. 4,477,075, Cl. 273-26.00C.
Owen, Wickersham & Erickson, P.C.: *See*—
Lindberg, John E., 4,476,817, Cl. 123-3.000.
Owens-Corning Fiberglas Corporation: *See*—
Helser, Jerry L., 4,477,397, Cl. 264-37.000.
Owens-Illinois, Inc.: *See*—
Pauluk, Harry J.; and Zauner, Otto, 4,477,275, Cl. 65-158.000.
Oxford Research Systems Limited: *See*—
Gordon, Roy E., 4,477,777, Cl. 324-300.000.
Ozaki, Tadashi: *See*—
Hattori, Tadashi; Ozaki, Tadashi; Miura, Kazuhiko; and Ootsuka, Yoshinori, 4,476,709, Cl. 73-35.000.
Ozu, Masao, to Tokyo Shibaura Denki Kabushiki Kaisha. Refrigeration cycle apparatus. 4,476,691, Cl. 62-217.000.
P.F.W. Beheer B.V.: *See*—
van den Bosch, Steven; Kettenes, Dirk K.; de Ross, Kris B.; Sipma, Gerben; and Stoffelsma, Jan, 4,477,678, Cl. 549-62.000.
P.I.A. Textiles A/S: *See*—
Rasmussen, Ib R., 4,476,608, Cl. 15-353.000.
Paarmann, James. Fishing pole holder. 4,476,645, Cl. 43-15.000.
Pack-All, Inc.: *See*—
Kessler, Sheldon; and Strubulis, Vasilios, 4,476,973, Cl. 198-744.000.
Paddock, Paul F.; Krage, William G.; and Conway, Tim D., to Sunkist Growers, Inc. Method and apparatus for grading articles according to their surface color. 4,476,982, Cl. 209-582.000.
Pallosy nee Becker, Katalin: *See*—
Pasztor, Emil; Lazar, Laszlo ; Nagy, Jozsef; and Pallosy nee Becker, Katalin, 4,477,255, Cl. 604-97.000.
Palmer, Charles E., to Palmer Systems, Incorporated. Method and apparatus for inserting bags onto cards. 4,476,619, Cl. 29-429.000.
Palmer, Christopher W.; and Hughes, Ronald M., to Lucas Industries Limited. Automatic adjuster for a shoe drum brake. 4,476,963, Cl. 188-79.50B.
Palmer Systems, Incorporated: *See*—
Palmer, Charles E., 4,476,619, Cl. 29-429.000.
Palombo, Gaston A.; and Do, Dung D., to Dataproducts Corporation. Phase commutator for closed loop control of a stepping motor. 4,477,757, Cl. 318-696.000.
Pao, David S. C. Method of scleral marking. 4,476,862, Cl. 128-303.170.
Paoletti, Frank; and Schubert, Steven A., to International Business Machines Corporation. Electroless plating monitor. 4,477,484, Cl. 427-10.000.
Papetti, Andrea; and Pedrini, Cesare, to S.P.A. Officine Maccaferri gia Raffaele Maccaferri & Figli. Flexible mattress-like element usable at ballast for immobilizing and protecting underwater pipelines. 4,477,206, Cl. 405-172.000.
Pappas, Harry J. Fuel filter. 4,477,352, Cl. 210-448.000.
Parish, Darrell J., to Du Pont de Nemours, E. I., and Company. Polyimide film. 4,477,620, Cl. 524-423.000.
Park, Hee K.; and Yamaguchi, Tadanori, to Tektronix, Inc. Process for manufacturing MOS integrated circuit with improved method of forming refractory metal silicide areas. 4,477,310, Cl. 156-643.000.
Parkinson, Kenneth; and Kennedy, Peter, to United Kingdom Atomic Energy Authority. Production of reaction-bonded silicon carbide bodies. 4,477,493, Cl. 427-228.000.
Parks, Leon C., to Research Against Cancer, Inc. Apparatus for effecting hyperthermic treatment. 4,476,867, Cl. 128-400.000.
Parnell, John V., III: *See*—
Saladini, Joseph J.; Parnell, John V., III; Steensen, Wayne L.; and Topalian, Harry H., 4,477,474, Cl. 426-250.000.
Partridge, Charles C., to ACF Industries, Incorporated. Valve seat for ball valves. 4,477,055, Cl. 251-174.000.
Partus, Fred P.: *See*—
Lynch, Brian; and Partus, Fred P., 4,477,273, Cl. 65-3.120.
Passino, Roberto: *See*—
Liberti, Lorenzo; Boari, Gianfranco; and Passino, Roberto, 4,477,355, Cl. 210-665.000.
Pasztor, Emil; Lazar, Laszlo ; Nagy, Jozsef; and Pallosy nee Becker, Katalin. Pharmaceutically acceptable silicon rubber and therapeutical set and the use thereof for surgical embolization. 4,477,255, Cl. 604-97.000.
Patton, Albert L. Motorized wheelchair and means for steering the same. 4,476,949, Cl. 180-65.100.
Paul, Amy S.: *See*—
Collins, Robert F.; and Paul, Amy S., 4,476,860, Cl. 128-132.00D.
Pauley, Charles R.: *See*—
Pearce, Roscoe L.; Wolcott, Richard A.; and Pauley, Charles R., 4,477,419, Cl. 423-228.000.
Pauluk, Harry J.; and Zauner, Otto, to Owens-Illinois, Inc. Station indicator. 4,477,275, Cl. 65-158.000.
PDR Manufacturing Corporation: *See*—
Reichert, Ronald F.; Kruger, Steven K.; and Rhodes, John W., 4,476,940, Cl. 173-37.000.
Pearce, Roscoe L.; Wolcott, Richard A.; and Pauley, Charles R., to Dow Chemical Company, The. Process for the recovery of CO_2 from flue gases. 4,477,419, Cl. 423-228.000.
Pearl, David R.; and Wolfson, Lawrence S., to Gerber Garment Technology, Inc. Apparatus for working limp sheet material on a conveyor. 4,476,756, Cl. 83-422.000.
Pearson, James E., to United Technologies Corporation. Adaptive optical system having automatic feedback aperture control. 4,477,720, Cl. 250-201.000.
Pease Machine & Tool, Inc.: *See*—
Bricker, Robert W.; Pease, Timothy K.; Pease, Michael G.; and Kirby, Jarvis, 4,476,625, Cl. 29-734.000.

Pease, Michael G.: *See—*
Bricker, Robert W.; Pease, Timothy K.; Pease, Michael G.; and Kirby, Jarvis, 4,476,625, Cl. 29-734.000.
Pease, Timothy K.: *See—*
Bricker, Robert W.; Pease, Timothy K.; Pease, Michael G.; and Kirby, Jarvis, 4,476,625, Cl. 29-734.000.
PEDCo, Inc.: *See—*
Reed, Leland M.; Reed, William A.; and Saeman, Walter C., 4,477,331, Cl. 208-8.00R.
Pedrini, Cesare: *See—*
Papetti, Andrea; and Pedrini, Cesare, 4,477,206, Cl. 405-172.000.
Peerlkamp, Erik R., to Stamicarbon B.V. Rotational molding method using polyolefin powder compositions. 4,477,400, Cl. 264-45.700.
Pegram, Warren J.: *See—*
Cooper, Ralph M.; and Pegram, Warren J., 4,477,142, Cl. 339-125.00R.
Pelczarski, Walter J., to Allied Corporation. Mounting mechanism for flanged electrical modules and the like. 4,477,047, Cl. 248-201.000.
Pellegrino, John, to Data General Corporation. Core saturation control circuit. 4,477,867, Cl. 363-26.000.
Pena-Medina, Sergio. Apparatus for increasing the efficiency of carburetors for internal combustion engines. 4,476,843, Cl. 123-585.000.
Penco, Sergio: *See—*
Suarato, Antonino; Penco, Sergio; and Arcamone, Federico, 4,477,444, Cl. 424-180.000.
Penney, Carl M.: *See—*
Liliquist, Robert D.; and Penney, Carl M., 4,477,712, Cl. 219-124.340.
Pennwalt Corporation: *See—*
Carroll, James W.; and Comstock, James E., 4,477,290, Cl. 148-6.000.
Penzes, Imre: *See—*
Matyasi, Jozsef; Kaptay, Gyorgy; Zsembery, Laszlo ; Kokeny, Bela; Toth, Jozsef T.; Toth Nee Homostrei, Maria; and Penzes, Imre, 4,477,427, Cl. 423-628.000.
Perlin, Alfred R., to Kendall Company, The. Esophageal probe with disposable cover. 4,476,872, Cl. 128-642.000.
Perrin, Bernard; Bianchin, Bernard; and Sauret, Georges, to Centre Technique de L'Industrie des Papiers, Cartons et Celluloses. Process for fractionating solid particles suspended in a liquid, in particular for treating paper-industry fiber suspensions. 4,477,359, Cl. 210-785.000.
Perry, Mordechai: *See—*
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,477,634, Cl. 525-327.100.
Persichillo, Frank J. Multiple purpose pipe connecting brackets. 4,477,200, Cl. 403-174.000.
Personick, Stewart D.: *See—*
Asawa, Charles K.; Austin, Joseph W.; Barnoski, Michael K.; Jackson, Allan R.; Personick, Stewart D.; and Yao, Shi-Kay, 4,477,725, Cl. 250-231.00R.
Pesek, Jiri: *See—*
Ruzek, Zdenka; Ruzek, Pavel O.; and Pesek, Jiri, 4,477,249, Cl. 431-253.000.
Peter, Jurgen: *See—*
Kroll, Gerald; Vogel, Horst; and Peter, Jurgen, 4,476,664, Cl. 53-258.000.
Peters, Joseph H., to U.S. Philips Corporation. Differential pulse code modulation transmission system. 4,477,915, Cl. 375-30.000.
Petersen, Arthur W.: *See—*
Kazmierczak, Thomas F.; Dulina, Richard; and Petersen, Arthur W., 4,477,288, Cl. 134-19.000.
Peterson, Erik W.: *See—*
Burns, Henry L.; and Peterson, Erik W., 4,476,707, Cl. 73-4.00R.
Peterson, Francis C.: *See—*
Cearlock, Steven V.; Peterson, Francis C.; and Kunos, Gene S., 4,477,307, Cl. 156-580.000.
Peterson, John I.; and Fitzgerald, Raphael V., to United States of America, Health and Human Services. Fiber optic $P_{O}2$ probe. 4,476,870, Cl. 128-634.000.
Peterson, Thomas W.: *See—*
Pettit, Donald R.; and Peterson, Thomas W., 4,477,187, Cl. 356-335.000.
Peterson, William J.: *See—*
Glennon, Timothy F.; Peterson, William J.; and Thom, James B., 4,477,765, Cl. 322-20.000.
Petrig, L. Benno: *See—*
Riva, Charles E.; and Petrig, L. Benno, 4,476,878, Cl. 128-745.000.
Petrocine, David V.; and Swidinsky, John A., to CPC International Inc. Production of alkyl-5-substituted-3-furoate compounds. 4,477,679, Cl. 549-486.000.
Petrolite Corporation: *See—*
Alink, Bernardus A. O., 4,477,674, Cl. 548-146.000.
Petrovich, Vojislav. Froth flotation method for recovering metal values with dihydroxy oleic acid. 4,477,340, Cl. 209-166.000.
Pettibone Corporation: *See—*
Vifian, Paul R.; and Kint, Gregory C., 4,477,030, Cl. 241-208.000.
Pettiford, Michael E.: *See—*
Goel, Anil B.; and Pettiford, Michael E., 4,477,385, Cl. 260-410.90R.
Pettit, Donald R.; and Peterson, Thomas W., to University Patents, Inc. Apparatus and method for sizing particles. 4,477,187, Cl. 356-335.000.
Peyman, Gholman A.: *See—*
Pollock, Stephen C.; Grisolano, James M., Jr.; and Peyman, Gholman A., 4,477,158, Cl. 351-169.000.
Pfaff Industriemaschinen GmbH: *See—*
Vollmar, Kurt, 4,476,795, Cl. 112-316.000.
Vollmar, Kurt, 4,476,796, Cl. 112-320.000.
Pfizer Inc.: *See—*
Cue, Berkeley W.; and Massett, Stephen S., 4,477,671, Cl. 546-291.000.
Massett, Stephen S., 4,477,669, Cl. 546-85.000.
Pfyffer, Peter M.; and Ruegg, Albert, to Rieter Machine Works, Ltd. Method an apparatus for inserting threads and similar items into a winding device. 4,477,032, Cl. 242-18.0PW.
Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, to Roussel Uclaf. 3-Keto-19-nor-Δ4,9-steroids. 4,477,445, Cl. 424-239.000.
Phillips, Cecil L., to Scott Bader Company Limited. Laminates containing inorganic structural materials. 4,477,533, Cl. 428-458.000.
Phillips, Dougald S. M.: *See—*
Millar, Thomas D.; and Phillips, Dougald S. M., 4,476,719, Cl. 73-200.000.
Phillips, John R. Hot bed power. 4,476,684, Cl. 60-689.000.
Phillips Petroleum Company: *See—*
Aldag, Arthur W., Jr., 4,477,592, Cl. 502-342.000.
Hawley, Gil R., 4,477,588, Cl. 502-119.000.
Hill, H. Wayne, Jr., 4,477,652, Cl. 528-232.000.
McDaniel, Max P., 4,477,586, Cl. 502-104.000.
Stapp, Paul R., 4,476,929, Cl. 166-273.000.
Picard, Harrison R., to United Technologies Corporation. Face seal means with back-up seal. 4,477,088, Cl. 277-83.000.
Pickering, Mark A., to Carrier Corporation. Noise reducing heat exchanger assembly for a combustion system. 4,476,850, Cl. 126-112.000.
Pietraszek, Pawel: *See—*
Olszewski, Witold; Lis, Andrzej; Pietraszek, Pawel; and Tuznik, Franciszek S., 4,477,344, Cl. 210-109.000.
Pijselman, Joel: *See—*
Cremona, Sauveur; and Pijselman, Joel, 4,477,518, Cl. 428-327.000.
Pilgrim, Thomas A., to BPB Industries Public Limited Company. Cementitious board manufacture. 4,477,300, Cl. 156-44.000.
Piltch, Martin S., to United States of America, Energy. Microwave-triggered laser switch. 4,477,746, Cl. 315-39.000.
Pinto, Akiva: *See—*
Keller, Alex J.; and Pinto, Akiva, 4,476,611, Cl. 19-105.000.
Pioneer Electronic Corporation: *See—*
Wada, Yasumitsu; and Yamamuro, Isao, 4,477,699, Cl. 179-116.000.
Yoshio, Junichi, 4,477,893, Cl. 369-244.000.
Pioneer Magnetics, Inc.: *See—*
Berger, James K., 4,477,849, Cl. 360-77.000.
Pittenger, Robert L.: *See—*
Brumbaugh, Charles T.; Pittenger, Robert L.; and Klees, Robert M., 4,477,814, Cl. 343-725.000.
Pittroff, Hans, to SKF Kugellagerfabriken GmbH. Method of adjusting a two row rolling bearing having adjustable prestress in the axial direction. 4,476,614, Cl. 29-148.40A.
Plank, Vernon G.; Crist, Stephen D.; and LaGross, Dennis L., to United States of America, Air Force. Rain rate meter. 4,476,718, Cl. 73-171.000.
Plastic Reel Corporation Of America: *See—*
Basili, Robert A., 4,476,990, Cl. 220-83.000.
Plastics, Inc.: *See—*
Danley, Allen M.; and Steingraber, Mark L., 4,477,705, Cl. 219-10.55E.
Platt, Herbert: *See—*
Deutsch, Alice; Brandwein, Harvey; Platt, Herbert; Hunter, Dianne M.; Dubitsky, Andrew; and Durham, Susan M., 4,477,576, Cl. 436-500.000.
Player, Wayne H. Insulated roofing system with slidable roof to ceiling clips. 4,476,659, Cl. 52-404.000.
PLC Peters Limited: *See—*
Hall, John L., 4,476,678, Cl. 60-404.000.
Pletka, Hans-Dieter: *See—*
Domesle, Rainer; Volker, Herbert; Koberstein, Edgar; and Pletka, Hans-Dieter, 4,477,417, Cl. 423-213.200.
Poate, John M.: *See—*
Gibson, John M.; Poate, John M.; and Tung, Raymond T., 4,477,308, Cl. 156-603.000.
Pogany, George A.: *See—*
van der Hulst, Harm; Pogany, George A.; and Kuyper, Jan, 4,477,589, Cl. 502-169.000.
Pohl, Dieter W.: *See—*
Chappell, Terry I.; Pohl, Dieter W.; and Woodall, Jerry M., 4,477,721, Cl. 250-211.00J.
Polaroid Corporation: *See—*
Bruder, Alan H., 4,477,544, Cl. 429-160.000.
Himmelwright, Richard S., 4,477,565, Cl. 430-567.000.
Poldervaart, Leendert; and Cuckson, John, to Single Buoy Moorings, Inc. Anchor. 4,476,802, Cl. 114-296.000.
Pollard, Earsel W. Energy generating and storage system for electric vehicle or the like. 4,477,764, Cl. 320-62.000.
Pollman, Frederic W.; and Crull, Stanley W., to Sundstrand Corporation. Pressure override control. 4,476,680, Cl. 60-444.000.
Pollock, Stephen C.; Grisolano, James M., Jr.; and Peyman, Gholman A. Lens system for variable refraction. 4,477,158, Cl. 351-169.000.
Polychrome Corporation: *See—*
Chu, Simon L.; Golda, Eugene; Huang, Jen-Chi; and Wilkes, Alan, 4,477,317, Cl. 204-33.000.
Polysar International S.A.: *See—*
Sinclair, Alvin R.; and Gleason, Edward H., 4,477,535, Cl. 428-476.300.

Poss, Dick A.; and Bijker, Anno, to Syrnes International B.V. Process for the preparation of polymer dispersions. 4,477,623, Cl. 524-710.000.

Ponsford, Roger J.: *See*—
Corbett, David F.; Brown nee Davis, Pamela; and Ponsford, Roger J., 4,477,662, Cl. 544-212.000.

Porter, James H.: *See*—
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Portmann, Hubert: *See*—
Michel, Jean-Georges; Portmann, Hubert; and Schneiter, Ali, 4,477,194, Cl. 368-69.000.

Pospisil, Peter: *See*—
Chlosta, Wolfgang; and Pospisil, Peter, 4,476,733, Cl. 73-863.910.

Potekhin, Konstantin F.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Turutin, Veniamin S.; Bezchastnov, Gennady A.; and Telezhnikov, Jury F., 4,477,690, Cl. 174-15.00C.

Pott, Carl C.: *See*—
Lindman, Nils T.; Fransson, Lars H.; and Pott, Carl C., 4,477,830, Cl. 358-1.000.

Potter, Steven E.: *See*—
Duffy, Brian J.; Gratz, Eugene J.; Potter, Steven E.; and Power, Royal A., 4,477,228, Cl. 416-241.00A.

Pouliquen, Yves: *See*—
Courtois, Yves; Barritault, Denis; and Pouliquen, Yves, 4,477,435, Cl. 424-95.000.

Powell, Leon T. Eye insert for taxidermy form. 4,477,500, Cl. 428-16.000.

Powell, Leon T.: *See*—
McKenzie, Larry G.; and Powell, Leon T., 4,477,082, Cl. 273-403.000.

Powell Manufacturing Company, Inc.: *See*—
Wilson, Robert W., 4,476,669, Cl. 56-27.500.

Power, Royal A.: *See*—
Duffy, Brian J.; Gratz, Eugene J.; Potter, Steven E.; and Power, Royal A., 4,477,228, Cl. 416-241.00A.

PPG Industries, Inc.: *See*—
Brown, Daniel G.; and Motsinger, Donald L., 4,477,524, Cl. 428-391.000.
Das, Balbhadra; and Moore, L. Dow, 4,477,496, Cl. 427-375.000.
Makhlouf, Joseph M.; McCollum, Gregory J.; and Kerr, Paul R., 4,477,405, Cl. 264-250.000.
Rau, Robert B., 4,477,508, Cl. 428-192.000.
Singer, Debra L.; McCollum, Gregory J.; Dowbenko, Rostyslaw; Christenson, Roger M.; Chau, Michael M.; and Chang, Wen-Hsuan, 4,477,618, Cl. 524-157.000.

Prasad, Jayasimha S.: *See*—
Yaron, Giora; Shum, Ying K.; Priel, Ury; Prasad, Jayasimha S.; and Ebel, Mark S., 4,477,825, Cl. 357-23.500.

Price, Derek T., to Dowty Meco Limited. Locking devices. 4,477,126, Cl. 308-1.00A.

Price, John G. Pin lock. 4,477,202, Cl. 403-316.000.

Pricer, Wilbur D.: *See*—
Cottrell, Peter E.; Gersbach, John E.; and Pricer, Wilbur D., 4,477,846, Cl. 360-46.000.

Pridgen, Lendon N.: *See*—
Lam, Bing L.; and Pridgen, Lendon N., 4,477,663, Cl. 544-310.000.

Priel, Ury: *See*—
Yaron, Giora; Shum, Ying K.; Priel, Ury; Prasad, Jayasimha S.; and Ebel, Mark S., 4,477,825, Cl. 357-23.500.

Procter & Gamble Company, The: *See*—
Wong, Louis F.; Sterling, Rosstain F.; and Borcher, Thomas A., Sr., 4,477,363, Cl. 252-134.000.

Proebsting, Robert J.; and Schroeder, Paul R., to Mostek Corporation. MOSFET Random access memory chip. 4,477,739, Cl. 307-449.000.

Proefstation voor Aardappelverwerking-TNO en Cooperatieve Verkoopen Produktievereniging van Aardappelmeel en Derivaten AVERE B.A.: *See*—
Hokse, Hendrik; Kaper, Frederik S.; and Wijpkema, Jacob T., 4,477,568, Cl. 435-97.000.

Profitt, James A.: *See*—
Ong, Helen H.; and Profitt, James A., 4,477,667, Cl. 546-17.000.

Promovo AB: *See*—
Bjorkman, Lars; and Bang, Borje, 4,476,606, Cl. 15-268.000.

Pronto, Stephen R., to Motorola, Inc. Retainer for printed circuit boards. 4,477,135, Cl. 339-14.00R.

Protas, Roger I. Countertop oven. 4,476,848, Cl. 126-19.00M.

Proulx, Raymond E. Multiple flail head for a rotary mower. 4,476,632, Cl. 30-276.000.

Pryor, David A., to Victor Equipment Company. Mixer for cutting torch. 4,477,262, Cl. 48-180.000.

Pryor, James W., to R. J. Reynolds Tobacco Company. Apparatus for application of additives to cigarette filter tow. 4,476,807, Cl. 118-317.000.

Pryor, Michael J.: *See*—
Winter, Joseph; and Pryor, Michael J., 4,477,147, Cl. 350-96.230.

Puri, Prem; and Puri, Yogi K., to International Business Machines Corporation. Testing method for assuring AC performance of high performance random logic designs using low speed tester. 4,477,902, Cl. 371-25.000.

Puri, Yogi K.: *See*—
Puri, Prem; and Puri, Yogi K., 4,477,902, Cl. 371-25.000.

Puropore, Inc.: *See*—
Kesting, Robert E., 4,477,598, Cl. 521-62.000.

Puschnerat, Helmut: *See*—
Fischer, Rudolf; and Puschnerat, Helmut, 4,477,066, Cl. 270-52.000.

Pust, Harold W., to Teledyne Industries, Inc. Method of making an electrochemical sensor. 4,477,403, Cl. 264-104.000.

Putman, Thomas H.; Sweetana, Andrew S., Jr.; and Brown, Frederick J., to Westinghouse Electric Corp. Modular power system reactor. 4,477,792, Cl. 336-180.000.

Quacquarini, Florindo; and Severini, Florindo. Flexible wooden insole and underlying support. 4,476,638, Cl. 36-86.000.

Quadra Wheelchairs, Inc.: *See*—
Minnebraker, Jeffrey P., 4,477,098, Cl. 280-242.0WC.

Quinn, Chester P.: *See*—
Szlam, Aleksander; and Quinn, Chester P., 4,477,698, Cl. 179-90.0BD.

Quiring, Bernd: *See*—
Kohler, Robert; Nippe, Burkhard; Kober, Heinrich; Schilffarth, Karlchristian; Meckel, Walter; and Quiring, Bernd, 4,477,531, Cl. 428-425.900.

R. Funk and Co., Inc.: *See*—
Funk, Roger S., 4,477,166, Cl. 354-300.000.

R. J. Reynolds Tobacco Company: *See*—
Pryor, James W., 4,476,807, Cl. 118-317.000.

R. R. Donnelley & Sons Company: *See*—
Clark, David A.; Strong, David C.; and White, Thomas Q., II, 4,477,833, Cl. 358-80.000.

Raceway Components, Inc.: *See*—
Kohaut, John E., 4,477,694, Cl. 174-48.000.

Racki, Daniel J., to Westinghouse Electric Corp. Integral heat pipe-electrode. 4,477,911, Cl. 373-36.000.

Radiant Technology Corporation: *See*—
Crain, Norman R.; and Hardison, Robert P., 4,477,718, Cl. 219-388.000.

Radiometer A/S: *See*—
Nielsen, Povl H., 4,477,330, Cl. 204-414.000.

Radtke, Gerhard: *See*—
Dimakos, Christos; and Radtke, Gerhard, 4,476,861, Cl. 128-303.00R.

Radulescu, Marian: *See*—
Apetrei, Constantin; Nitigus, Victor; Demeter, Elek; Radulescu, Marian; and Sachelarie, Toma, 4,477,743, Cl. 310-77.000.

Rahmfeld, Werner; Kubon, Achim; and Stalleicken, Dieter. Method for regulating individual drives of an arcuately shaped multi-roller continuous strand casting machine for metal, particularly steel. 4,476,915, Cl. 164-484.000.

Ramirez, Enrique G., to Dow Chemical Company, The. Method for preparing a catalyst for the dehydration of an alkanolamine. 4,477,591, Cl. 502-340.000.

Rao, Gururaj S.: *See*—
Losq, Jacques J.; Rao, Gururaj S.; and Sachar, Howard E., 4,477,872, Cl. 364-200.000.

Rapp, Gunther: *See*—
Grosskinsky, Otto-Alfred; Frommer, Elmar; Rapp, Gunther; and Thomas, Erwin, 4,477,424, Cl. 423-387.000.

Raskin, Neil R., to Foster Wheeler Energy Corporation. Process for preparing a sulfur dioxide containing gas stream for reaction with coal. 4,477,426, Cl. 423-569.000.

Rasmussen, Ib R., to P.I.A. Textiles A/S. Apparatus for removal of ash. 4,476,608, Cl. 15-353.000.

Raspanti, Giuseppe; and Fossati, Norberto, to Apital Produzioni Industriali S.p.A. Polypiperidinyl stabilizing agents for polymer materials. 4,477,615, Cl. 524-100.000.

Rathgeber, Gerhard, to Bayerische Motoren Werke AG. Control unit for a heating and/or air conditioning system for automobiles. 4,477,018, Cl. 236-1.00B.

Ratzel, Rudiger; and Schneider, Erich, to Robert Bosch GmbH. Safety interlock for an electric positioning system. 4,477,753, Cl. 318-563.000.

Rau, Robert B., to PPG Industries, Inc. Edge treatment to prepare non-circular plastic sheets for compression stretching. 4,477,508, Cl. 428-192.000.

Rauch, Georg. Stencil making and utilization methods, apparatus and articles. 4,477,557, Cl. 430-308.000.

Raytheon Company: *See*—
Margerum, Donald L., 4,477,773, Cl. 324-79.00R.

RCA Corporation: *See*—
Anderson, Wendell G., 4,477,817, Cl. 343-861.000.
Chen, Thomas Y.; and Gibson, Walter G., 4,477,841, Cl. 358-335.000.
Clurman, Stanley P., 4,477,894, Cl. 369-270.000.
Gorog, Istvan, 4,477,891, Cl. 369-109.000.
Hope, George P.; and Rhodes, Randy D., 4,476,994, Cl. 220-318.000.
Nossen, Steve J.; Brokl, Stanley S.; and McGuire, Kenyon E. B., 4,477,918, Cl. 377-37.000.
Tosima, Soitiro; and Nishikawa, Masayoshi, 4,477,892, Cl. 369-132.000.

Rediger, Alvin L., to General Electric Company. Laminated core, apparatus and methods. 4,477,306, Cl. 156-578.000.

Reed, Leland M.; Reed, William A.; and Saeman, Walter C., to PEDCo, Inc. Method for retorting particulate solids having recoverable volatile constituents in a rotating horizontal chamber. 4,477,331, Cl. 208-8.00R.

Reed, Robert W., to United States of America, Navy. Dual channel gated peak detector. 4,477,779, Cl. 328-151.000.

Reed, William A.: *See*—
Reed, Leland M.; Reed, William A.; and Saeman, Walter C., 4,477,331, Cl. 208-8.00R.
Regan, Albert M., to Hughes Tool Company. Retractable stinger purge valve. 4,476,934, Cl. 166-368.000.
Regie Nationale des Usines Renault: *See*—
Lacroix, Marc; and Bienvenu, Raymond, 4,476,997, Cl. 221-171.000.
Reguant Soler, Jaime, to Agut, S.A. Tripping device for thermal relays. 4,477,703, Cl. 200-76.000.
Reichert, Ronald F.; Kruger, Steven K.; and Rhodes, John W., to PDR Manufacturing Corporation. Portable drilling apparatus. 4,476,940, Cl. 173-37.000.
Reichi, Alfred, to Johannes Heidenhain GmbH. Position measuring apparatus utilizing flexible steel band containing grid divisions. 4,477,726, Cl. 250-237.00G.
Reid, William J., to Ciba-Geigy Corporation. Hindered phenolic esters of oligomeric glycols as chain terminators for polyvinyl chloride polymerization. 4,477,638, Cl. 526-84.000.
Reilly, Roger D., to Deere & Company. Tilt and dump grass collection box and box latch and door closure mechanism therefor. 4,476,668, Cl. 56-202.000.
Reimann, George J.; Benoit, Gordon L.; Gavin, James R.; and Schneider, Michael A., to Mobil Oil Corporation. Thermoplastic bag pack. 4,476,979, Cl. 206-554.000.
Reinke, Friedhelm; and Emde, Friedhelm. Mechanical control element having wear-resistant surface. 4,476,824, Cl. 123-90.390.
Reiss, Gerhard, to Bayer Aktiengesellschaft. Molecular sieve zeolite for producing hydrogen by pressure variation adsorption technique. 4,477,267, Cl. 55-68.000.
Renis, Harold E.: *See*—
Skulnick, Harvey I.; and Renis, Harold E., 4,477,442, Cl. 424-180.000.
Repp, Mary E. D. Apparatus for supporting a catheter drainage bag and tube. 4,477,046, Cl. 248-95.000.
Reppas, George S.; and Drexhage, Gerrit K., to Optimum Space Systems. Convertible furniture with force equilibrium and latch mechanism. 4,476,592, Cl. 5-164.00B.
Repperger, Daniel W., to United States of America, Air Force. Biodynamic resistant control stick. 4,477,043, Cl. 244-223.000.
Research Against Cancer, Inc.: *See*—
Parks, Leon C., 4,476,867, Cl. 128-400.000.
Reuss, Max L., Jr., to United States of America, Navy. Combined microwave parallel amplifier- RF attenuator/modulator. 4,477,781, Cl. 330-286.000.
Reven, Frederick V., to Nalco Chemical Company. Electrode coating and coated electrodes. 4,477,579, Cl. 501-1.000.
Revirieux, Michel, to Electronique Marcel Dassault. Electrical contact device for an electronic card processing apparatus. 4,477,774, Cl. 324-158.00P.
Rexnord Inc.: *See*—
Bradbury, Bernard G., 4,476,974, Cl. 198-832.000.
Reynes, Jean-Pierre, to Societe E. LaCroix-Tous Artifices. Anti-tank mine. 4,476,784, Cl. 102-428.000.
Rhodes, John W.: *See*—
Reichert, Ronald F.; Kruger, Steven K.; and Rhodes, John W., 4,476,940, Cl. 173-37.000.
Rhodes, Randy D.: *See*—
Hope, George P.; and Rhodes, Randy D., 4,476,994, Cl. 220-318.000.
Ricci, Giorgio; and Federici, Giorgio, to Biodata S.p.A. Method for determination of cytoplasmatic and mitochondrial isoenzymes of glutamic-oxalacetic transaminase in human serum or plasma. 4,477,566, Cl. 435-16.000.
Rich, Colin: *See*—
Foster, Derek; and Rich, Colin, 4,476,801, Cl. 114-230.000.
Richards, Harvey J.: *See*—
Goel, Anil B.; and Richards, Harvey J., 4,477,382, Cl. 260-398.000.
Richter, Gerhard; Luft, Gunter; and Gebhardt, Ulrich, to Siemens Aktiengesellschaft. Method for determining sugar concentration. 4,477,314, Cl. 204-1.00T.
Rickard, Lawrence C. Archery bowstring releasing device. 4,476,845, Cl. 124-35.00A.
Rickert, David W., to Storage Technology Corporation. Method of suppressing seek-excited vibration in a disk drive or similar servo system. 4,477,755, Cl. 318-611.000.
Ricoh Co., Ltd.: *See*—
Oba, Hideaki; Kunikane, Makoto; Umehara, Masaakira; Tanikawa, Kiyoshi; and Abe, Michiharu, 4,477,555, Cl. 430-273.000.
Ricoh Watch Co., Ltd.: *See*—
Katsuoka, Ritsu, 4,476,767, Cl. 84-115.000.
Riedel, Wolfgang: *See*—
Rossmann, Christian; and Riedel, Wolfgang, 4,477,286, Cl. 134-10.000.
Rieman, Willis: *See*—
Barry, Leon G.; and Rieman, Willis, 4,476,714, Cl. 73-118.000.
Rieskamp, Klaus: *See*—
Brunner, Anton; and Rieskamp, Klaus, 4,477,815, Cl. 343-756.000.
Rieter Machine Works, Ltd.: *See*—
Oswald, Heinz, 4,477,034, Cl. 242-18.0PW.
Pfyffer, Peter M.; and Ruegg, Albert, 4,477,032, Cl. 242-18.0PW.
Rifu, Toshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Radiation detector. 4,477,728, Cl. 250-385.000.
Riggs, James B., to Mobil Oil Corporation. Method for controlling H_2/CO ratio of in-situ coal gasification product gas. 4,476,927, Cl. 166-261.000.
Riggs, Olen L., Jr., to Kerr-McGee Chemical Corporation. Method of preparing electrolytic manganese dioxide. 4,477,320, Cl. 204-96.000.
Riker Laboratories, Inc.: *See*—
Wade, James J., 4,477,450, Cl. 424-246.000.
Rinaldi, Francesco: *See*—
D'Altilia, Gianluigi; and Rinaldi, Francesco, 4,477,277, Cl. 75-0.50B.
Ring, Michael; and Kirk, William K., to International Paper Company. Method and apparatus for preparing thermoplastic coated webs and products thereof. 4,477,495, Cl. 427-356.000.
Ris Irrigation Systems Pty. Limited: *See*—
Tucker, Alfred D., 4,477,343, Cl. 210-108.000.
Riva, Charles E.; and Petrig, L. Benno. Blood velocity measurement in retinal capillaries utilizing the blue field entoptic phenomenon. 4,476,878, Cl. 128-745.000.
Robert Bosch GmbH: *See*—
Buck, Manfred; Muller, Frank; and Wanner, Karl, 4,476,941, Cl. 173-117.000.
Gotze, Gerd-Wolfgang, 4,476,724, Cl. 73-585.000.
Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, 4,477,027, Cl. 239-585.000.
Laufer, Helmut, 4,476,835, Cl. 123-467.000.
Mausner, Eberhard, 4,477,732, Cl. 307-9.000.
Ratzel, Rudiger; and Schneider, Erich, 4,477,753, Cl. 318-563.000.
Straubel, Max; and Wessel, Wolf, 4,476,829, Cl. 123-357.000.
Roberts, Robert C., to Babcock & Wilcox Company, The. Electrical circuit for providing an abnormal transient display system for nuclear reactor operation. 4,477,804, Cl. 340-747.000.
Roberts, Steven D.: *See*—
Knox, Dick L.; and Roberts, Steven D., 4,477,230, Cl. 417-63.000.
Robertson, John R., to ICI Americas Inc. Silicone surfactant/organofunctional polysiloxane internal mold release agents. 4,477,366, Cl. 252-182.000.
Robinson, E. Montgomery, to Atlas Paper Box Company. Easel device for display shelf. 4,476,986, Cl. 211-134.000.
Robinson, Edward L., Jr.; and Gesior, Augustyn M., to International Harvester Co. Seed monitor apparatus harness adapter for a convertible planter. 4,477,801, Cl. 340-684.000.
Robinson, Thomas C.; and Kitrilakis, Sotiris. Engine. 4,476,821, Cl. 123-68.000.
Rocci, Joseph D.; and Crook, Stephen E., to General Instrument Corporation. Security apparatus with alarm search and verification capability. 4,477,799, Cl. 340-533.000.
Roch, Gerald V.; Wiles, James P.; and Hadley, Chris L., to Hurco Mfg. Co. Inc. Interactive machining system. 4,477,754, Cl. 318-568.000.
Rockford Products Corporation: *See*—
Bonacorsi, Jerry, 4,477,217, Cl. 411-387.000.
Norberg, Richard A.; and Selin, Ronald L., 4,476,985, Cl. 211-126.000.
Rockwell International Corporation: *See*—
Grantham, LeRoy F.; and McKenzie, Donald E., 4,477,373, Cl. 252-626.000.
Rodewald, Paul G., to Mobil Oil Corporation. Silica-modified catalyst and use for selective production of para-dialkyl substituted benzenes. 4,477,583, Cl. 502-71.000.
Roeder, George K. Double acting engine and pump. 4,477,234, Cl. 417-393.000.
Rogers, Alisa K.; and Weber, Kenneth E., to Lockheed Corporation. Apparatus for maintaining peroxide concentration. 4,477,329, Cl. 137-93.000.
Rogers, Arthur H., Jr.: *See*—
Miles, Laughton E.; Rogers, Arthur H., Jr.; and Rogers, Charles H., 4,477,578, Cl. 436-518.000.
Rogers, Charles H.: *See*—
Miles, Laughton E.; Rogers, Arthur H., Jr.; and Rogers, Charles H., 4,477,578, Cl. 436-518.000.
Rogers Corporation: *See*—
Balash, Frederick A.; and Caton, Mary T., 4,477,700, Cl. 200-5.00A.
Rogers, Ross, Jr.: *See*—
Greenwald, Edward H., Sr.; O'Malley, William P.; and Rogers, Ross, Jr., 4,477,220, Cl. 414-139.000.
Rohde, Clarence J.; and Farley, Donald J., to Rohde, Clarence J.; Farley, Donald J.; Selhulster, Joseph P.; and Hart, John R. Cast concrete element for underground tubular structure. 4,477,204, Cl. 405-153.000.
Rohm GmbH: *See*—
Lehmann, Jurgen; Vetter, Heinz; and Arnold, Wolfgang, 4,477,521, Cl. 428-336.000.
Rohm and Haas Company: *See*—
Sanderson, F. Thomas.; and Gehman, David R., 4,477,622, Cl. 524-522.000.
Rohner, Joachim; and Zumfeld, Heinz, to W. Schlafhorst & Co. Device for the partial straightening and parallelizing of the fibers of a thread or thread end. 4,476,671, Cl. 57-261.000.
Rohr Industries, Inc.: *See*—
Holland, Charles L.; and Jennings, Dale L., 4,477,012, Cl. 228-181.000.
Rokos, George H. S.: *See*—
Arton, Kenneth A. M.; and Rokos, George H. S., 4,477,805, Cl. 340-784.000.
Rolaussf, Hans: *See*—
Conrads, Hans; Hoffmans, Josef; Hippel, Hans; Hoven, Hubert; Rolaussf, Hans; and Schafer, Max, 4,476,793, Cl. 112-221.000.

Romand-Monnier, Jacques: *See*—
Gilmer, Andre ; Romand-Monnier, Jacques; and Lejeune, Jean-Pierre, 4,477,235, Cl. 417-414.000.

Ronden, Clifford P.; and Boylance, Donald C., to Husky Oil Operations Ltd. Method for removing solids and water from petroleum crudes. 4,477,337, Cl. 208-188.000.

Ross, David. Portable vacuum cleaning device. 4,476,607, Cl. 15-339.000.

Rossmann, Christian; and Riedel, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Breaking oil-in-water emulsions. 4,477,286, Cl. 134-10.000.

Roszkowski, A. Peter: *See*—
Waterbury, L. David; and Roszkowski, A. Peter, 4,477,460, Cl. 424-270.000.

Rothauser, Theresa: *See*—
Bender, Dean R.; Karady, Sandor; and Rothauser, Theresa, 4,477,668, Cl. 546-72.000.

Roussel Uclaf: *See*—
Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, 4,477,445, Cl. 424-239.000.

Rover-Scott Bonnar Limited: *See*—
Green, Douglas F., 4,477,029, Cl. 241-101.700.

Rowell, Roger M.: *See*—
Chen, George C.; and Rowell, Roger M., 4,477,389, Cl. 260-453.0PH.

Royer, William W.: *See*—
Ferguson, George R.; and Royer, William W., 4,477,107, Cl. 285-134.000.

Rozniecki, Edward J., to United States of America, Army. Rapid acting two stage pyrotechnic valve for fixed fire extinguishers. 4,476,937, Cl. 169-26.000.

Ruble, Harold P., to La-Z-Boy Chair Co. Reclining and rocking office chair. 4,477,118, Cl. 297-85.000.

Ruckel, Raymond R.: *See*—
Banks, Thomas M.; Ruckel, Raymond R.; Spencer, Samuel F.; and Walker, John Q., 4,476,734, Cl. 73-864.160.

Rud, Mayer, to Singer Company, The. Beam position detection system for use in an optical scanning system. 4,477,727, Cl. 250-237.00G.

Rudd, Robert E., III, to Burroughs Corporation. Pulsed aperture for an electrostatic ink jet system. 4,477,869, Cl. 346-140.00R.

Ruegg, Albert: *See*—
Pfyffer, Peter M.; and Ruegg, Albert, 4,477,032, Cl. 242-18.0PW.

Ruhrkohle Aktiengesellschaft: *See*—
Hellmann, Karl, 4,477,338, Cl. 209-5.000.

Rummel, Mitzie K., to Du Pont de Nemours, E. I., and Company. Multilayer silicone coating. 4,477,517, Cl. 428-324.000.

Rundo, John R., to B. F. Goodrich Company, The. Method of winding strip material and lining strip. 4,477,036, Cl. 242-67.200.

Russel, Matthew J., to Eastman Kodak Company. Apparatus for producing multiple image simplex and duplex copies in a single pass. 4,477,176, Cl. 355-3.0TR.

Russell, James L., to Arinc Research Corporation. Correlation data communications system. 4,477,912, Cl. 375-1.000.

Rutgerswerke Aktiengesellschaft: *See*—
Knips, Ulrich; Bohmer, Bertram; and Herzberg, Roland, 4,477,380, Cl. 260-385.000.

Rutherford, Alan: *See*—
Luoma, Thomas; and Rutherford, Alan, 4,477,822, Cl. 346-136.000.

Ruti-te Strake B.V.: *See*—
Gunneman, Paul, 4,476,903, Cl. 139-435.000.

Ruzek, Pavel O.: *See*—
Ruzek, Zdenka; Ruzek, Pavel O.; and Pesek, Jiri, 4,477,249, Cl. 431-253.000.

Ruzek, Zdenka; Ruzek, Pavel O.; and Pesek, Jiri. Flame-producing sound-emitting device. 4,477,249, Cl. 431-253.000.

Rynbrandt, Jay D., to Chevron Research Company. Electric car and roadway system. 4,476,947, Cl. 180-2.100.

Ryobi Ltd.: *See*—
Yorikane, Toshiaki, 4,477,038, Cl. 242-84.21R.

S.N.E.C.M.A.: *See*—
Aurousseau, Christian; and Odeyer, Pierre P. L., 4,476,675, Cl. 60-39.281.

Sachar, Howard E.: *See*—
Losq, Jacques J.; Rao, Gururaj S.; and Sachar, Howard E., 4,477,872, Cl. 364-200.000.

Sachelarie, Toma: *See*—
Apetrei, Constantin; Nitigus, Victor; Demeter, Elek; Radulescu, Marian; and Sachelarie, Toma, 4,477,743, Cl. 310-77.000.

Sachkov, Alexandr E.: *See*—
Kanshin, Nikolai N.; Guskov, Igor A.; Konoplev, Alexei A.; Sachkov, Alexandr E.; and Mats, Matvei M., 4,476,863, Cl. 128-305.000.

SACK GmbH: *See*—
Wrossok, Willi, 4,476,914, Cl. 164-444.000.

Saeman, Walter C.: *See*—
Reed, Leland M.; Reed, William A.; and Saeman, Walter C., 4,477,331, Cl. 208-8.00R.

Sagar, Vispi R.: *See*—
Longo, Trent F.; Sagar, Vispi R.; and Stayer, Mark L., 4,477,656, Cl. 528-487.000.

Sahara, Masayoshi: *See*—
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,477,164, Cl. 354-286.000.

Saikawa, Isamu: *See*—
Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,664, Cl. 544-360.000.

Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,666, Cl. 544-385.000.

Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,477,437, Cl. 424-116.000.

Sainen, Tsutomu, to Tsudakoma Corporation. Apparatus for detecting weft yarn in jet looms. 4,476,901, Cl. 139-370.200.

St. Joseph Bank & Trust Co., Executor: *See*—
D'Alelio, Gaetano F., deceased, 4,477,439, Cl. 424-162.000.

Saito, Takashi, to Victor Company of Japan, Ltd. Disc accommodating case. 4,476,978, Cl. 206-444.000.

Saito, Teruo; Asai, Kuniaki; Nakagawa, Isamu; and Kobayashi, Tadayasu, to Sumitomo Chemical Company, Limited. Aromatic polysulfone resin composition suitable for use in self-lubricating molding compositions. 4,477,630, Cl. 525-133.000.

Saito, Toshihiko: *See*—
Hisaoka, Satoshi; Matsuzaka, Takashi; and Saito, Toshihiko, 4,477,246, Cl. 431-114.000.

Saito, Yasuji, to Kabushiki Kaisha Nichibei. Roll-blind. 4,476,910, Cl. 160-291.000.

Saitoh, Mitsuo; Kamiyama, Yasuo; and Murata, Mitsuhiro, to Citizen Watch Company Limited. Arrangement of analog-type electronic wristwatch. 4,477,195, Cl. 368-88.000.

Saitou, Akira: *See*—
Isogai, Jun; Nakaya, Seiichi; Saitou, Akira; Takahashi, Akio; and Yagi, Isao, 4,477,284, Cl. 106-104.000.

Sakabe, Yukio: *See*—
Nishioka, Goro; Komatsu, Hiroshi; and Sakabe, Yukio, 4,477,581, Cl. 501-137.000.

Sakai, Hiroshi: *See*—
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,477,437, Cl. 424-116.000.

Sakai, Kango; Yoshihara, Ryoichi; Sakurai, Hiroshi; and Minamida, Katsuhiro, to Nippon Steel Corporation. Long-life insoluble electrode and process for preparing the same. 4,477,316, Cl. 204-290.00F.

Sakai, Muneo: *See*—
Seto, Akiro; Sakai, Muneo; and Sakita, Takashi, 4,477,472, Cl. 426-98.000.

Sakamoto, Keiji: *See*—
Kurakake, Mitsuo; and Sakamoto, Keiji, 4,477,762, Cl. 318-802.000.

Sakamoto, Nobuo: *See*—
Menjo, Hiroshi; Watanabe, Yoshikazu; and Sakamoto, Nobuo, 4,477,561, Cl. 430-509.000.

Sakamoto, Shuichi: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; Iwamoto, Hidenori; and Sakamoto, Shuichi, 4,477,443, Cl. 424-180.000.

Sakanoue, Kei: *See*—
Ichijima, Seiji; Sakanoue, Kei; Kobayashi, Hidetoshi; and Adachi, Keiichi, 4,477,563, Cl. 430-544.000.

Sakata, Hiromi: *See*—
Kozuka, Nobuhiko; Koyama, Shigeo; Kai, Masami; Takahashi, Ichiro; Sakata, Hiromi; and Kano, Atsushi, 4,477,173, Cl. 355-3.0DD.

Sakita, Takashi: *See*—
Seto, Akiro; Sakai, Muneo; and Sakita, Takashi, 4,477,472, Cl. 426-98.000.

Sako, Yuji: *See*—
Mori, Teijiro; Masuda, Shigeru; Okado, Hiroyuki; Kakizoe, Masahiro; and Sako, Yuji, 4,477,704, Cl. 200-144.00R.

Sakurai, Hiroshi: *See*—
Sakai, Kango; Yoshihara, Ryoichi; Sakurai, Hiroshi; and Minamida, Katsuhiro, 4,477,316, Cl. 204-290.00F.

Sakurai, Katsumi: *See*—
Sano, Shigeru; Sakurai, Katsumi; Ono, Tatsuo; Tsuruoka, Kanji; and Watanabe, Masaru, 4,477,708, Cl. 219-10.670.

Sakurai, Masao: *See*—
Nishi, Yasuyuki; Takagi, Masasi; and Sakurai, Masao, 4,476,692, Cl. 62-228.500.

Saladini, Joseph J.; Parnell, John V., III; Steensen, Wayne L.; and Topalian, Harry H., to General Foods Corporation. Process for solubilizing FD and C Red #3 under acidic conditions and composition. 4,477,474, Cl. 426-250.000.

Saleeb, Fouad Z.: *See*—
Eisenhardt, William A., Jr.; Saleeb, Fouad Z.; McKay, Randal P.; and Zeller, Bary L., 4,477,481, Cl. 426-590.000.

Salvi, Theodore C.; Smithers, Martin E.; and Dente, Gregory C., to United States of America, Air Force. Unstable optical resonator with cancelling edge waves. 4,477,909, Cl. 372-95.000.

Salzgeber, Daniel E., to Stanadyne, Inc. Method and system for fuel injection timing. 4,476,837, Cl. 123-502.000.

Samim Societa Azionaria Minero-Metallurgica SpA: *See*—
D'Altilia, Gianluigi; and Rinaldi, Francesco, 4,477,277, Cl. 75-0.50B.

Sanchez, Joseph P., to Warner-Lambert Company. Certain 1,8-naphthyridine compounds useful as antibacterial agents. 4,477,449, Cl. 424-246.000.

Sanden Corporation: *See*—
Terauchi, Kiyoshi, 4,477,238, Cl. 418-5.000.

Yoshii, Yuji; and Hiraga, Masaharu, 4,477,239, Cl. 418-55.000.
Sanders, Robert N., to Ethyl Corporation. Zeolite Y. 4,477,423, Cl. 423-328.000.
Sanderson, F. Thomas.; and Gehman, David R., to Rohm and Haas Company. Contact adhesives. 4,477,622, Cl. 524-522.000.
Sandner, Bernhard: *See*—
Deiner, Hans; Mosch, Franz; Sandner, Bernhard; and Bernheim, Willy, 4,477,498, Cl. 427-389.900.
Sandoz Ltd.: *See*—
Hamberger, Helmut; and Fliri, Hans, 4,477,448, Cl. 424-246.000.
Sandvik, Leonard E.: *See*—
Thompson, James E.; Sandvik, Leonard E.; and Elliott, Marc A., 4,477,050, Cl. 248-636.000.
Sano, Shigeru; Sakurai, Katsumi; Ono, Tatsuo; Tsuruoka, Kanji; and Watanabe, Masaru, to Nippon Kokan Kabushiki Kaisha. Apparatus for preheating the ends of upset steel pipes. 4,477,708, Cl. 219-10.670.
Sanyo Electric Co., Ltd.: *See*—
Hosoya, Nobukazu, 4,477,831, Cl. 358-27.000.
Sargent Industries, Inc.: *See*—
Choate, Bruce R., 4,477,197, Cl. 384-296.000.
Saruyama, Toshio: *See*—
Fukayama, Miyoji; Suganuma, Noriyuki; and Saruyama, Toshio, 4,477,606, Cl. 523-200.000.
Sasaki, Ryoichi: *See*—
Shiga, Masao; Kirihara, Seishin; Kuriyama, Mitsuo; Yoshioka, Takatoshi; and Sasaki, Ryoichi, 4,477,280, Cl. 75-124.000.
Sasaki, Seishi: *See*—
Sugita, Ryuji; Kanai, Kenji; Sasaki, Seishi; and Takahashi, Ken, 4,477,488, Cl. 427-129.000.
Sasaki, Takanori: *See*—
Muramoto, Takayoshi; Nishino, Shingi; Sasaki, Toshiyuki; and Sasaki, Takanori, 4,477,414, Cl. 422-125.000.
Sasaki, Takuya: *See*—
Otake, Katsumoto; Miyai, Masahiko; Sasaki, Takuya; Mukai, Yasuteru; Takahashi, Sankichi; and Okouchi, Isao, 4,476,917, Cl. 165-1.000.
Sasaki, Toshiyuki: *See*—
Muramoto, Takayoshi; Nishino, Shingi; Sasaki, Toshiyuki; and Sasaki, Takanori, 4,477,414, Cl. 422-125.000.
Sasamoto, Yasuhiko: *See*—
Kagawa, Takahiko; and Sasamoto, Yasuhiko, 4,477,476, Cl. 426-262.000.
Sasson, Ezra. Corrosion inhibiting organic coatings. 4,477,281, Cl. 106-14.340.
Sato, Hideo: *See*—
Horie, Seiji; Nagata, Masayoshi; Nakano, Junji; and Sato, Hideo, 4,477,550, Cl. 430-59.000.
Sato, Kuniaki; Yasunaga, Hisao; Yoshihara, Takahisa; Fujita, Yoshinori; and Kyono, Kazuaki, to Kawasaki Steel Corporation. One-side zinc hot dipping process using an anti-plating agent. 4,477,491, Cl. 427-211.000.
Sato, Masayuki, to Hitachi Construction Machinery Co., Ltd. Civil engineering and construction machinery with hydraulic drive system. 4,476,679, Cl. 60-434.000.
Sato, Susumu; Onda, Masaru; and Ikegami, Mikihiko, to Bridgestone Tire Company Limited. Rubber compositions for tire containing a specific carbon black. 4,477,621, Cl. 524-496.000.
Sato, Takashi: *See*—
Ogasahara, Hiroshi; Asai, Osatsugu; and Sato, Takashi, 4,477,689, Cl. 174-15.0CA.
Sato, Yasuhisa, to Canon Kabushiki Kaisha. Photographic objective. 4,477,154, Cl. 350-432.000.
Sato, Yasuhisa; Yokota, Hideo; and Yamada, Yasuyuki, to Canon Kabushiki Kaisha. Photographic lens of the partial focusing type. 4,477,155, Cl. 350-469.000.
Satzinger, Gerhard: *See*—
Herrmann, Wolfgang; Geibel, Wolfram; and Satzinger, Gerhard, 4,477,661, Cl. 544-49.000.
Sauder, Charles J., to O.S. Equipment Inc. Dispensing apparatus. 4,477,219, Cl. 414-126.000.
Sauer, Rudolf: *See*—
Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, 4,477,027, Cl. 239-585.000.
Sauerbrunn, Robert D.: *See*—
Iwasyk, John M; and Sauerbrunn, Robert D., 4,477,271, Cl. 55-416.000.
Saul, Ben; and Hartley, Doug, to Sur-Gard Security Systems Ltd. Fire Alarm control system. 4,477,798, Cl. 340-527.000.
Sauret, Georges: *See*—
Perrin, Bernard; Bianchin, Bernard; and Sauret, Georges, 4,477,359, Cl. 210-785.000.
Scales, John T.; and Wilkinson, Michael J., to National Research Development Corporation. Antimicrobial surgical implants. 4,476,590, Cl. 3-1.910.
Scapa Inc.: *See*—
Westhead, William T., 4,476,902, Cl. 139-383.00A.
Scartazzini, Riccardo; and Bickel, Hans, to Ciba-Geigy Corporation. Process for the preparation of cepham and cephem compounds. 4,477,658, Cl. 544-16.000.
Schaefer, Donald D., to Dunham-Bush, Inc. Vertical axis hermetic helical screw rotary compressor with discharge gas oil mist eliminator and dual transfer tube manifold for supplying liquid refrigerant and refrigerant vapor to the compression area. 4,477,233, Cl. 417-366.000.
Schafer, Ewald; and Jung, Harald, to Karl Otto Braun KG. Wound dressing. 4,476,697, Cl. 66-193.000.
Schafer, Max: *See*—
Conrads, Hans; Hoffmans, Josef; Hippel, Hans; Hoven, Hubert; Rolauss', Hans; and Schafer, Max, 4,476,793, Cl. 112-221.000.
Schaltenbrand, Eugene D.: *See*—
Nijhawan, Pramodh; and Schaltenbrand, Eugene D., 4,477,910, Cl. 373-9.000.
Scherer, Jeremy D. Microcircuit package and sealing method. 4,477,828, Cl. 357-80.000.
Schering Corp.: *See*—
Gold, Elijah H.; and Chang, Wei K., 4,477,378, Cl. 260-239.0BB.
Scherzer, Julius, to Harshaw/Filtrol Partnership. Acid dealuminated Y-zeolite and cracking process employing the same. 4,477,336, Cl. 208-120.000.
Schilffarth, Karlchristian: *See*—
Kohler, Robert; Nippe, Burkhard; Kober, Heinrich; Schilffarth, Karlchristian; Meckel, Walter; and Quiring, Bernd, 4,477,531, Cl. 428-425.900.
Schinkoth, Gerhard: *See*—
Hage, Manfred; and Schinkoth, Gerhard, 4,476,704, Cl. 72-276.000.
Schirmer, Henry G., to W. R. Grace & Co., Cryovac Div. Manifolds for strutted film. 4,476,896, Cl. 137-561.00A.
Schliep, Hans-Jochen: *See*—
Jonas, Rochus; Kloft, Michael; Wurziger, Hanns; Harting, Juergen; Enenkel, Hans J.; Minck, Klaus-Otto; and Schliep, Hans-Jochen, 4,477,454, Cl. 424-250.000.
Schmale, Peter C., to U.S. Philips Corporation. Circuit for generating a sawtooth current in a coil. 4,477,749, Cl. 315-397.000.
Schmidlkofer, Jakob: *See*—
Huber, Peter; Wimmer, Franz; Innertsberger, Ernst; and Schmidlkofer, Jakob, 4,477,371, Cl. 252-358.000.
Schmidt, Anthony J. Outdoor grill breather. 4,476,849, Cl. 126-25.00R.
Schmidt, Donald L.; Klingler, Thomas C.; and Wessling, Ritchie A., to Dow Chemical Company, The. Addition polymerizable aromatic sulfonium salts and polymers thereof. 4,477,640, Cl. 526-256.000.
Schmidt, Paul J.: *See*—
Crounse, Nathan N.; and Schmidt, Paul J., 4,477,676, Cl. 548-493.000.
Schmukler, Seymour; Machonis, John, Jr.; and Shida, Mitsuzo, to Chemplex Company. Composite structures. 4,477,532, Cl. 428-441.000.
Schneider, Andre: *See*—
Cesar, Jean P.; Gouttebessis, Jacques; and Schneider, Andre, 4,476,908, Cl. 152-357.00A.
Schneider, Erich: *See*—
Ratzel, Rudiger; and Schneider, Erich, 4,477,753, Cl. 318-563.000.
Schneider, Henry; Maleszka, Ryszard; Wang, Patrick Y.; Veliky, Ivan A.; and Chan, Yui-Kwok, to Canadian Patents & Development Limited. Pentose fermentation with selected yeast. 4,477,569, Cl. 435-161.000.
Schneider, Michael A.: *See*—
Reimann, George J.; Benoit, Gordon L.; Gavin, James R.; and Schneider, Michael A., 4,476,979, Cl. 206-554.000.
Schneider, Randy G.: *See*—
Bohannon, William D., Jr.; Kinard, Michael D.; and Schneider, Randy G., 4,477,298, Cl. 156-54.000.
Schneiter, Ali: *See*—
Michel, Jean-Georges; Portmann, Hubert; and Schneiter, Ali, 4,477,194, Cl. 368-69.000.
Schnur, Nicholas E.: *See*—
Beimesch, Bruce J.; Schnur, Nicholas E.; and Hughes, Clarence J., Jr., 4,477,383, Cl. 260-410.600.
Schnurer, Otmar, to Volkswagenwerk AG. Hydraulic brake system for vehicles. 4,477,123, Cl. 303-24.00R.
Schoening, Josef; Schwiers, Hans-Georg; and Mitterbacher, Paul, to Hochtemperatur-Reaktorbau GmbH. Reinforced concrete pressure vessels for nuclear reactor installations. 4,477,409, Cl. 376-296.000.
Schoneweiss, Klaus, to O&K Orenstein & Koppel Aktiengesellschaft. Safety device for conveyance systems for people. 4,476,971, Cl. 198-323.000.
Schoonmaker, C. Donald; and Bortkevicius, Jonas, to General Foods Corporation. Apparatus and method for producing frozen confections. 4,477,473, Cl. 426-231.000.
Schouhamer Immink, Kornelis A.; and Vries, Lodewijk B., to U.S. Philips Corporation. Error correction method for the transfer of blocks of data bits, a device for preforming such a method, a decoder for use with such a method, and a device comprising such a decoder. 4,477,903, Cl. 371-37.000.
Schroeder, Paul R.: *See*—
Proebsting, Robert J.; and Schroeder, Paul R., 4,477,739, Cl. 307-449.000.
Schubert, Steven A.: *See*—
Paoletti, Frank; and Schubert, Steven A., 4,477,484, Cl. 427-10.000.
Schulke, Karl A., to Heraeus Quarzschmelze GmbH. Semiconductor substrate handling tray. 4,477,112, Cl. 294-16.000.
Schulte, Klaus: *See*—
Ersfeld, Heinrich; and Schulte, Klaus, 4,477,191, Cl. 366-77.000.
Schultz, Ronald E.: *See*—
Schumacher, Gary L.; Struger, Odo J.; and Schultz, Ronald E., 4,477,882, Cl. 364-900.000.
Schumacher, Gary L.; Struger, Odo J.; and Schultz, Ronald E., to Allen-Bradley Company. Communications network for programmable controllers. 4,477,882, Cl. 364-900.000.
Schwab, Wilfried: *See*—
Lossack, Edgar; Spriestersbach, Jochen; Baur, Josef; and Schwab, Wilfried, 4,476,911, Cl. 164-65.000.

Schwarz, Rudolf; and Kleiner, Walter, to Staeubli Ltd. Braking mechanism for a shed-forming machine. 4,476,899, Cl. 139-1.00E.

Schweiss, Peter; and Dorflinger, Hans-Dieter, to J. M. Voith GmbH. Injector apparatus having a constriction in a following adjoining mixing pipe. 4,477,341, Cl. 209-170.000.

Schwelm, Hans, to Barmag Barmer Maschinenfabrik AG. Hydraulic flow control valve. 4,476,893, Cl. 137-486.000.

Schwiers, Hans-Georg: *See*—
Schoening, Josef; Schwiers, Hans-Georg; and Mitterbacher, Paul, 4,477,409, Cl. 376-296.000.

Scientific Resources, Inc.: *See*—
Bentkowski, James E., 4,476,722, Cl. 73-434.000.

Scientific Systems, Inc.: *See*—
Charney, Andrew R.; Kercher, Paul W.; and America, William, 4,476,731, Cl. 73-863.730.

Scott Bader Company Limited: *See*—
Phillips, Cecil L., 4,477,533, Cl. 428-458.000.

Scott, Graham, to Steetley Industries Ltd. Chemical anchor cartridges. 4,477,208, Cl. 405-261.000.

Scroggin, Stanley R.: *See*—
Henry, James W.; and Scroggin, Stanley R., 4,477,398, Cl. 264-40.100.

Sega, Masahisa; and Kikuchi, Akira, to Tokico Ltd. Arm for a programme controlled manipulator. 4,477,221, Cl. 414-735.000.

Seidel, Hartmut; and Hammerschmidt, Winrich B., to NATEC Institut. One-piece, washable and sterilizable plastic shoe. 4,476,600, Cl. 12-142.00V.

Seidel, William C.; Orozovich, George E.; and Medcalf, Darrell G., to General Foods Corporation. Method of preparing a clean flavored cereal starch. 4,477,480, Cl. 426-578.000.

Seiki, Kazuo: *See*—
Asahara, Meiji; Seiki, Kazuo; and Omori, Hiroshi, 4,476,672, Cl. 57-333.000.

Seiko Instruments & Electronics Ltd.: *See*—
Nakamura, Kohichi; and Morita, Yoshiyuki, 4,477,877, Cl. 364-571.000.

Sekiguchi, Yuji: *See*—
Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, 4,477,094, Cl. 277-235.00B.

Selhulster, Joseph P.: *See*—
Rohde, Clarence J.; and Farley, Donald J., 4,477,204, Cl. 405-153.000.

Selin, Ronald L.: *See*—
Norberg, Richard A.; and Selin, Ronald L., 4,476,985, Cl. 211-126.000.

Sendair International Limited: *See*—
Yare, Leslie J., 4,477,210, Cl. 406-166.000.

Senga, Takao: *See*—
Yamada, Jun; Senga, Takao; and Suzuki, Shigeyoshi, 4,477,547, Cl. 430-14.000.

Sentinel Manufacturing Company, Inc.: *See*—
Mills, J. T., 4,476,825, Cl. 123-198.0DB.

Seo, Kazuo: *See*—
Nakayama, Keizo; and Seo, Kazuo, 4,477,855, Cl. 361-54.000.

Serota, Samuel; and Linfield, Warner M., to United States of America, Agriculture. Preparation of α-substituted acrylic acids. 4,477,384, Cl. 260-410.90R.

Seta, Shigetoshi: *See*—
Muroi, Soichi; Seta, Shigetoshi; Matsumoto, Yoshio; Yasui, Koichi; and Imamura, Kazuyoshi, 4,477,636, Cl. 525-444.000.

Setescak, Linda L.: *See*—
Martin, Lawrence L.; and Setescak, Linda L., 4,477,465, Cl. 424-275.000.

Seto, Akiro; Sakai, Muneo; and Sakita, Takashi, to Nissin Oil Mills, Ltd. Process for preparing powdered oil and fat. 4,477,472, Cl. 426-98.000.

Severini, Florindo: *See*—
Quacquarini, Florindo; and Severini, Florindo, 4,476,638, Cl. 36-86.000.

Shafer, David: *See*—
Gebelein, Rolin J.; and Shafer, David, 4,477,156, Cl. 350-503.000.

Shah, Mahesh N.: *See*—
Smeltzer, Paul; Shah, Mahesh N.; and Guzder, Shapoor B., 4,477,062, Cl. 267-64.280.

Shah, Rasiklal P.; and Gleason, Cynthia L., to General Electric Company. Energy efficient multi-stage water gas shift reaction. 4,476,683, Cl. 60-648.000.

Shapiro, Marvin: *See*—
Mortlock, Clarence E.; Brady, Joseph A.; and Shapiro, Marvin, 4,477,845, Cl. 360-26.000.

Sharp, Kenneth P., to Fairchild Camera & Instrument Corporation. Current dump circuit for bipolar random access memories. 4,477,885, Cl. 365-204.000.

Sharp, Mark E., to Fife, Robert L. Offset pivot guiding assembly. 4,477,006, Cl. 226-18.000.

Shaver, John D.; Adkins, Claude G.; and Spengler, Walter. Apparatus and method for neutralizing static electric charges in sensitive manufacturing areas. 4,477,263, Cl. 55-6.000.

Sheehan, Richard W., to Sherwood Research Corporation. Reinforcing element and method of making the same. 4,477,522, Cl. 428-359.000.

Shell Canada Limited: *See*—
Lukaszewicz, George, 4,476,603, Cl. 15-104.3SN.

Shell Oil Company: *See*—
Berni, Albert J., 4,477,887, Cl. 367-20.000.
Nielsen, Robert P., 4,477,639, Cl. 526-124.000.
van der Hulst, Harm; Pogany, George A.; and Kuyper, Jan, 4,477,589, Cl. 502-169.000.

Sheller-Globe Corporation: *See*—
Bailey, Larry E.; and Morello, Edward B., 4,477,504, Cl. 428-138.000.

Sheng, Shinan-Chur; and Lastovka, Joseph B., to Spectra-Physics, Inc. Cold cathode construction. 4,477,908, Cl. 372-88.000.

Shepard, Kenneth L., to Merck & Co., Inc. Acyloxy derivatives of [phenylsulfonyl(or sulfinyl)]thiophenesulfonamide for the topical treatment of elevated intraocular pressure. 4,477,466, Cl. 424-275.000.

Sherrick, Peter L.: *See*—
Urban, John A.; and Sherrick, Peter L., 4,476,968, Cl. 188-329.000.

Sherwood Research Corporation: *See*—
Sheehan, Richard W., 4,477,522, Cl. 428-359.000.

Shibata, Toshihiro: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Shibata, Toshihiro, 4,477,616, Cl. 524-102.000.

Shibukawa, Mitsuru: *See*—
Nishikido, Joji; Kodama, Eiji; and Shibukawa, Mitsuru, 4,477,659, Cl. 544-21.000.

Shibusawa, Masaru, to Wacoal Corp. Short girdle. 4,476,895, Cl. 128-546.000.

Shida, Mitsuzo: *See*—
Schmukler, Seymour; Machonis, John, Jr.; and Shida, Mitsuzo, 4,477,532, Cl. 428-441.000.

Shiga, Masao; Kirihara, Seishin; Kuriyama, Mitsuo; Yoshioka, Takatoshi; and Sasaki, Ryoichi, to Hitachi, Ltd. Heat resisting steel. 4,477,280, Cl. 75-124.000.

Shimizu, Keiichi: *See*—
Mochida, Haruo; Shimizu, Keiichi; and Namazue, Hirotoshi, 4,477,806, Cl. 340-825.320.

Shimodaira, Toshirou: *See*—
Wakai, Kiyoshi; Shimodaira, Toshirou; and Fukushima, Yoneharu, 4,477,747, Cl. 315-200.00A.

Shimojo, Fumio: *See*—
Ueda, Ikuo; Teraji, Tsutomu; Takaya, Takao; Takai, Keiji; Takasugi, Hisashi; Shimojo, Fumio; and Nishino, Shigetaka, 4,477,447, Cl. 424-246.000.

Shinoda, Kazuo; and Isobe, Toshiaki, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling the fuel supply of an internal combustion engine. 4,476,831, Cl. 123-480.000.

Shinohara, Koji: *See*—
Fukuda, Hirokazu; Shinohara, Koji; Kawabata, Yoshio; Nishijima, Yoshito; and Yamamoto, Kosaku, 4,477,730, Cl. 250-504.00R.

Shirahata, Ryuji: *See*—
Yanai, Akio; Shirahata, Ryuji; and Kitamoto, Tatsuji, 4,477,489, Cl. 427-132.000.

Shopsmith, Inc.: *See*—
Morris, David S., 4,476,757, Cl. 83-446.000.

Showa Electric Wire & Cable Co., Ltd.: *See*—
Karasawa, Kohichi; Itoh, Takeo; Koizumi, Humihito; and Uchida, Kimio, 4,477,045, Cl. 248-1.000.
Waki, Misao, 4,477,624, Cl. 524-736.000.

Showscan Film Corporation: *See*—
Trumbull, Douglas, 4,477,160, Cl. 352-40.000.

Shuey, John R.; and Widener, Donald R., to AMP Incorporated. Polarizing and latch arrangement for an electrical connector. 4,477,022, Cl. 339-59.00M.

Shum, Ying K.: *See*—
Yaron, Giora; Shum, Ying K.; Priel, Ury; Prasad, Jayasimha S.; and Ebel, Mark S., 4,477,825, Cl. 357-23.500.

Siemens Aktiengesellschaft: *See*—
Baumann, Heinz; and Gerlach, Hans-Jurgen, 4,477,923, Cl. 378-95.000.
Brunner, Anton; and Rieskamp, Klaus, 4,477,815, Cl. 343-756.000.
Fazekas, Peter, 4,477,775, Cl. 324-158.00R.
Liebetruth, Reiner, 4,477,922, Cl. 378-20.000.
Richter, Gerhard; Luft, Gunter; and Gebhardt, Ulrich, 4,477,314, Cl. 204-1.00T.
Voigtlaender, Kurt, 4,476,991, Cl. 220-89.00A.

Siena College: *See*—
Donnelly, Denis P., 4,477,917, Cl. 377-11.000.

Silander, Torsten G., to AB Tesi. Method of time-marking sedimentation processes. 4,477,574, Cl. 436-70.000.

Silbering, Steven B.; and Sipos, Tibor, to Johnson & Johnson Products, Inc. Oral compositions comprising N^{α},N^{G}-diacyl derivatives of arginine. 4,477,428, Cl. 424-52.000.

Silbering, Steven B.; and Sipos, Tibor, to Johnson & Johnson Products, Inc. Oral compositions comprising N^{α}-alkyl derivatives of arginine. 4,477,429, Cl. 424-52.000.

Silva, Raimund H.: *See*—
Bissot, Thomas C.; and Silva, Raimund H., 4,477,321, Cl. 204-98.000.

Simonson, William B., Jr. Conduit setting implement. 4,476,618, Cl. 29-272.000.

Sinclair, Alvin R.; and Gleason, Edward H., to Polysar International S.A. Coated papers. 4,477,535, Cl. 428-476.300.

Singer, Alfred R. E., to National Research Development Corporation. Metal-coating a metallic substrate. 4,477,291, Cl. 148-11.50Q.

Singer Company, The: *See*—
Karlow, Basil, 4,477,789, Cl. 335-257.000.
Rud, Mayer, 4,477,727, Cl. 250-237.00G.
Stiles, John C.; and Ljung, Bo H. G., 4,477,188, Cl. 356-350.000.

Singer, Debra L.; McCollum, Gregory J.; Dowbenko, Rostyslaw; Christenson, Roger M.; Chau, Michael M.; and Chang, Wen-Hsuan, to PPG Industries, Inc. Aminoplast curable coating compositions

containing sulfonic acid esters as latent acid catalysts. 4,477,618, Cl. 524-157.000.

Singer, Martin H.: *See—*
Judd, Thomas H.; King, Michael C.; Klemmer, Edmund T.; and Singer, Martin H., 4,477,697, Cl. 179-84.00T.

Single Buoy Moorings, Inc.: *See—*
Poldervaart, Leendert; and Cuckson, John, 4,476,802, Cl. 114-296.000.

Sipma, Gerben: *See—*
van den Bosch, Steven; Kettenes, Dirk K.; de Ross, Kris B.; Sipma, Gerben; and Stoffelsma, Jan, 4,477,678, Cl. 549-62.000.

Sipos, Tibor: *See—*
Silbering, Steven B.; and Sipos, Tibor, 4,477,428, Cl. 424-52.000.
Silbering, Steven B.; and Sipos, Tibor, 4,477,429, Cl. 424-52.000.

Sircar, Shivaji: *See—*
Kratz, Wilbur C.; and Sircar, Shivaji, 4,477,264, Cl. 55-25.000.
Kumar, Ravi; Sircar, Shivaji; White, Thomas R.; and Greskovich, Eugene J., 4,477,265, Cl. 55-26.000.

Sittenfield, Marcus, to Hazardous Waste Management, Inc. Detoxification of substances by utilization of ultrasonic energy. 4,477,357, Cl. 210-748.000.

SKF Kugellagerfabriken GmbH: *See—*
Leuner, Hilmar; Dobhan, Herbert; Bauer, Bernhard; and Olschewski, Armin, 4,476,913, Cl. 164-346.000.
Pittroff, Hans, 4,476,614, Cl. 29-148.40A.

Skulnick, Harvey I.; and Renis, Harold E., to Upjohn Company, The. Composition of matter and process. 4,477,442, Cl. 424-180.000.

SKW Trostberg Aktiengesellschaft: *See—*
Weiss, Stefan, 4,477,421, Cl. 423-275.000.

Slade, Joel; and Stanton, James L., to Ciba-Geigy Corporation. Heterobenzazepine derivatives and their pharmaceutical use. 4,477,464, Cl. 424-275.000.

Slyke, Mark V.: *See—*
Collinet, Jean C.; and Slyke, Mark V., 4,477,788, Cl. 333-235.000.

Smeets, Arnoldus A.: *See—*
Broeksema, Egbert; and Smeets, Arnoldus A., 4,477,328, Cl. 204-159.230.

Smeltzer, Paul; Shah, Mahesh N.; and Guzder, Shapoor B., to Maremont Corporation. Adjustable gas spring shock absorber and control device. 4,477,062, Cl. 267-64.280.

Smith, Darrell L.: *See—*
Lowery, James O.; Thomas, O. Leon; Baston, Nathan I.; Smith, Darrell L.; Jiles, Walter K.; and Starnes, R. Emory, Jr., 4,477,769, Cl. 324-54.000.

Smith, Dewey H., Jr., to Du Pont de Nemours, E. I., and Company. Method for inducing anorexia using nalmetrene. 4,477,457, Cl. 424-260.000.

Smith, Dwight, to Elkins, Marvin. Stencilling device. 4,476,976, Cl. 206-219.000.

Smith, Hoyt L.; and Farrar, D. Frank, Jr., to Cutters Exchange, Inc. Belt feed apparatus for cloth spreading machine. 4,477,065, Cl. 270-31.000.

Smith International, Inc.: *See—*
Alder, Robert L., 4,476,894, Cl. 137-552.700.
Morrill, Charles D., 4,476,897, Cl. 137-594.000.
Morrill, Charles D.; and Best, Michael J. A., 4,477,205, Cl. 405-169.000.

Smith, J. David, to Mark Products Incorporated. Takeout connector. 4,477,136, Cl. 339-49.00R.

Smith, Jay E., to United States of America, Energy. Self-closing shielded container for use with radioactive materials. 4,477,731, Cl. 250-506.100.

Smith, Norman L., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Door handle clip. 4,477,110, Cl. 292-1.000.

Smith, Peter H., to General Electric Company. Weight measuring arrangement for cooking appliance surface unit. 4,476,946, Cl. 177-144.000.

Smithers, Martin E.: *See—*
Salvi, Theodore C.; Smithers, Martin E.; and Dente, Gregory C., 4,477,909, Cl. 372-95.000.

SmithKline Beckman Corporation: *See—*
Brennan, Francis T.; Sosnowski, Genevieve F.; and Weinstock, Joseph, 4,477,470, Cl. 424-330.000.
Lam, Bing L.; and Pridgen, Lendon N., 4,477,663, Cl. 544-310.000.
Weinstock, Joseph; and Wiebelhaus, Virgil D., 4,477,455, Cl. 424-251.000.

Snap-on Tools Corporation: *See—*
Nelson, James W.; and Wente, Steven R., 4,477,213, Cl. 408-241.00R.

Snelling, Christopher, to Xerox Corporation. Multi-function reproduction machine. 4,477,175, Cl. 355-3.00R.

Snider, Warren E.: *See—*
Carlson, Gerald L.; and Snider, Warren E., 4,476,712, Cl. 73-61.10C.

So, Eddy, to Canadian Patents & Development Limited. Frequency compensator for a current-comparator capacitance bridge. 4,477,772, Cl. 324-59.000.

S.P.A. Officine Maccaferri gia Raffaele Maccaferri & Figli: *See—*
Papetti, Andrea; and Pedrini, Cesare, 4,477,206, Cl. 405-172.000.

Societe E. LaCroix-Tous Artifices: *See—*
Reynes, Jean-Pierre, 4,476,784, Cl. 102-428.000.

Societe Nationale Industrielle Aerospatiale: *See—*
Calabro, Max; Girard, Herve ; and Le Corre, Alain, 4,477,025, Cl. 239-265.350.

Sodeco-Saia, A.G.: *See—*
Gerber, Hermann, 4,477,744, Cl. 310-156.000.

Solartron Electronic Group Limited: *See—*
Cope, Stephen N., 4,477,878, Cl. 364-726.000.

Son, Pyong-Nae: *See—*
Lai, John T.; and Son, Pyong-Nae, 4,477,665, Cl. 544-384.000.

Sone, Shigenori: *See—*
Mihara, Takao; Morichika, Toshiaki; and Sone, Shigenori, 4,477,711, Cl. 219-121.0PJ.

Sony Corporation: *See—*
Matsuura, Tamiaki; Aiba, Takeshi; Fukushima, Takashi; Nishimura, Masanori; Ohtsuki, Hiroshi; Yabuki, Fujio; and Kusakabe, Tomio, 4,476,627, Cl. 29-791.000.
Nakano, Kenji; Machida, Yukihiko; and Odaka, Kentaro, 4,477,844, Cl. 360-8.000.
Yamamoto, Masanobu; and Umezu, Nobuhiko, 4,477,821, Cl. 346-108.000.

Sorenson, Paul D.; Dickson, Dale A.; McNichols, Larry A.; and Badzinski, John D., to Medtronic, Inc. Ultrasound scanning system for skeletal imaging. 4,476,873, Cl. 128-660.000.

Sosnowski, Genevieve F.: *See—*
Brennan, Francis T.; Sosnowski, Genevieve F.; and Weinstock, Joseph, 4,477,470, Cl. 424-330.000.

Soucek, Charles A.: *See—*
Aluotto, Patrick F.; Drees, Paul A.; and Soucek, Charles A., 4,477,609, Cl. 523-407.000.

Southwire Company: *See—*
Lowery, James O.; Thomas, O. Leon; Baston, Nathan I.; Smith, Darrell L.; Jiles, Walter K.; and Starnes, R. Emory, Jr., 4,477,769, Cl. 324-54.000.

Sowards, Gregory E. Sports training and practice device. 4,477,083, Cl. 273-411.000.

Spainhour, Carroll D.: *See—*
Nis, John R.; and Spainhour, Carroll D., 4,477,244, Cl. 432-11.000.

Spake, Ned B.: *See—*
Berry, William W.; Ashworth, Robert A.; and Spake, Ned B., 4,477,425, Cl. 423-485.000.

Spectra-Physics, Inc.: *See—*
Sheng, Shinan-Chur; and Lastovka, Joseph B., 4,477,908, Cl. 372-88.000.

Speer, Wayne; and Chupik, John M., to Chupik, John M. Door sill and adjustable threshold. 4,476,653, Cl. 49-468.000.

Spence, Clifton L.; and Lissiuk, Walter, to LogEtronics, Inc. Diffusion transfer processor. 4,477,165, Cl. 354-299.000.

Spencer, Samuel F.: *See—*
Banks, Thomas M.; Ruckel, Raymond R.; Spencer, Samuel F.; and Walker, John Q., 4,476,734, Cl. 73-864.160.

Spencer Turbine Company, The: *See—*
Kobylarz, Thomas L., 4,476,617, Cl. 29-264.000.

Spengler, Walter: *See—*
Shaver, John D.; Adkins, Claude G.; and Spengler, Walter, 4,477,263, Cl. 55-6.000.

Spensberger, Johann, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Machine for the precision working of the tooth surfaces on toothed workpieces. 4,477,214, Cl. 409-34.000.

Sperley, Richard J., to Uniroyal, Inc. Reinforced rubber composition containing ground coal. 4,477,611, Cl. 524-71.000.

Sperry Corporation: *See—*
Maben, Duane K., 4,476,905, Cl. 140-105.000.
Thorsrud, Lee T., 4,477,904, Cl. 371-49.000.
Wong, Wilson T. C., 4,477,879, Cl. 364-752.000.

Sperry, John A.: *See—*
Day, Peter M. G.; Jones, John W.; and Sperry, John A., 4,477,552, Cl. 430-175.000.

Sperti Drug Products, Inc.: *See—*
Sperti, George S.; and Sway, Boris, 4,477,361, Cl. 252-106.000.

Sperti, George S.; and Sway, Boris, to Sperti Drug Products, Inc. Antifungal-antibacterial detergents containing cinnamic compounds. 4,477,361, Cl. 252-106.000.

Spierer, Edward, to Magnetic Analysis Corporation. Apparatus and process for flux leakage testing using transverse and vectored magnetization. 4,477,776, Cl. 324-227.000.

Spiess, Karl: *See—*
Zorn, Helmut; Spiess, Karl; and Bina, Wenzel, 4,477,714, Cl. 219-149.000.

Spire Corporation: *See—*
Armini, Anthony J.; and Kreisman, Wallace S., 4,477,921, Cl. 378-34.000.

Spires, Dewayne A., to AT&T Bell Laboratories. Operational amplifier with multiple switchable outputs. 4,477,780, Cl. 330-265.000.

Spitler, Keith G.: *See—*
Liang, Tai-Ming; and Spitler, Keith G., 4,477,602, Cl. 521-137.000.

Spriestersbach, Jochen: *See—*
Lossack, Edgar; Spriestersbach, Jochen; Baur, Josef; and Schwab, Wilfried, 4,476,911, Cl. 164-65.000.

Spring Gully Pickles Pty, Limited: *See—*
Clyma, Malcolm R., 4,476,778, Cl. 99-516.000.

Spuhl AG: *See—*
Zangerle, Ernst, 4,476,702, Cl. 72-15.000.

SRI International: *See—*
Taenzer, Jon C.; Burch, Donald J.; and Green, Philip S., 4,476,874, Cl. 128-663.000.

Stables, Wilbur L.; Cooksey, James J.; and Newell, Harry L., Jr., to Allied Corporation. Apparatus for measuring gas velocity. 4,476,729, Cl. 73-861.610.

Staeubli Ltd.: *See—*
Schwarz, Rudolf; and Kleiner, Walter, 4,476,899, Cl. 139-1.00E.
Stafford, Donald W.: *See—*
Bowlds, Patsy A.; Dunn, David P.; Fathergill, Rex D.; Findlay, Hugh T.; and Stafford, Donald W., 4,477,198, Cl. 400-120.000.
Stafford, Lawrence. Safety device for scaffold. 4,476,958, Cl. 182-42.000.
Stalleicken, Dieter: *See—*
Rahmfeld, Werner; Kubon, Achim; and Stalleicken, Dieter, 4,476,915, Cl. 164-484.000.
Stamicarbon B.V.: *See—*
Peerlkamp, Erik R., 4,477,400, Cl. 264-45.700.
Stanadyne, Inc.: *See—*
Salzgeber, Daniel E., 4,476,837, Cl. 123-502.000.
Stant Inc.: *See—*
Szlaga, Emil, Jr., 4,477,345, Cl. 210-130.000.
Stanton, James L.: *See—*
Slade, Joel; and Stanton, James L., 4,477,464, Cl. 424-275.000.
Stapp, Paul R., to Phillips Petroleum Company. Sulfoxide cosurfactants in enhanced oil recovery processes. 4,476,929, Cl. 166-273.000.
Stark, William A.: *See—*
Liston, Max D.; Dickinson, David G.; and Stark, William A., 4,477,190, Cl. 356-418.000.
Starnes, R. Emory, Jr.: *See—*
Lowery, James O.; Thomas, O. Leon; Baston, Nathan I.; Smith, Darrell L.; Jiles, Walter K.; and Starnes, R. Emory, Jr., 4,477,769, Cl. 324-54.000.
Stauffer Chemical Company: *See—*
Anzenberger, Joseph F., Sr., 4,477,572, Cl. 436-6.000.
Band, Elliot I., 4,477,587, Cl. 502-111.000.
Fesman, Gerald, 4,477,600, Cl. 521-108.000.
Stayer, Mark L.: *See—*
Longo, Trent F.; Sagar, Vispi R.; and Stayer, Mark L., 4,477,656, Cl. 528-487.000.
Steckel, Thomas F., to Lubrizol Corporation, The. Method for preparing nitrogen- and oxygen-containing compositions useful as lubricant and fuel additives. 4,477,362, Cl. 252-51.50R.
Stedile, Udino: *See—*
Justus, Edgar J.; Stedile, Udino; and Bollani, Umberto, 4,476,637, Cl. 34-119.000.
Steel Heddle Manufacturing Company: *See—*
Bowen, James B., 4,476,900, Cl. 139-91.000.
Steensen, Wayne L.: *See—*
Saladini, Joseph J.; Parnell, John V., III; Steensen, Wayne L.; and Topalian, Harry H., 4,477,474, Cl. 426-250.000.
Steetley Industries Ltd.: *See—*
Scott, Graham, 4,477,208, Cl. 405-261.000.
Steigerwald, Robert L., to General Electric Company. High frequency series resonant dc-dc converter. 4,477,868, Cl. 363-28.000.
Stein, Joseph L. Adjustable crutch. 4,476,885, Cl. 135-69.000.
Steiner, Gerd; Friedrich, Ludwig; and Lenke, Dieter, to BASF Aktiengesellschaft. 5,6-Dihydro-11-methylenemorphanthridin-6-ones, their preparation and drugs containing these compounds. 4,477,451, Cl. 424-248.540.
Steiner, Holger, to Steiner KG. Selfhealing condenser. 4,477,858, Cl. 361-273.000.
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Steiner, Holger, 4,477,858, Cl. 361-273.000.
Steingraber, Mark L.: *See—*
Danley, Allen M.; and Steingraber, Mark L., 4,477,705, Cl. 219-10.55E.
Stephens, William R., to William R. and Zella B. Stephens Trust. Vane type rotary internal combustion engine with transfer valve in rotor. 4,476,826, Cl. 123-235.000.
Sterling, Rosstain F.: *See—*
Wong, Louis F.; Sterling, Rosstain F.; and Borcher, Thomas A., Sr., 4,477,363, Cl. 252-134.000.
Sterner, Hans A.: *See—*
Johansson, Ingvar; and Sterner, Hans A., 4,477,090, Cl. 277-174.000.
Steward, John H.; and Ladouceur, Harold A., to Multifastener Corporation. Fastener orienting, tapping and collection system. 4,476,599, Cl. 10-139.0WH.
Stich, Michael C.: *See—*
Collins, David W.; Neesz, John J.; and Stich, Michael C., 4,477,750, Cl. 318-270.000.
Stickler, David B., to Avco Everett Research Laboratory, Inc. Solubilization of carbonaceous material. 4,477,332, Cl. 208-8.00R.
Stiftelsen Prodinor: *See—*
Aren, Bjorn G. A., 4,476,612, Cl. 24-304.000.
Stiles, John C.; and Ljung, Bo H. G., to Singer Company, The. Monolithic three axis ring laser gyroscope. 4,477,188, Cl. 356-350.000.
Stoffelsma, Jan: *See—*
van den Bosch, Steven; Kettenes, Dirk K.; de Ross, Kris B.; Sipma, Cerben; and Stoffelsma, Jan, 4,477,678, Cl. 549-62.000.
Stoll, Kurt; and Glattli, Hans-Heinrich. Process for producing grooved choke plates for adjustable chokes. 4,477,404, Cl. 264-220.000.
Storage Technology Corporation: *See—*
Rickert, David W., 4,477,755, Cl. 318-611.000.
Strange, Carl P.; Messelt, Christopher D.; and Gibson, Clark W., to Dow Chemical Company, The. Process for preparing hydroxyalkylcellulose ethers. 4,477,657, Cl. 536-91.000.
Straubel, Max; and Wessel, Wolf, to Robert Bosch GmbH. Electronic control system for the fuel quantity of an internal combustion engine having self-ignition. 4,476,829, Cl. 123-357.000.
Strauss, Werner: *See—*
Heintges, Siegfried; Strauss, Werner; and Horn, Hannes S., 4,477,358, Cl. 210-783.000.
Strolle, Clifford H.: *See—*
Antonelli, Joseph A.; McLaughlin, Joseph E.; and Strolle, Clifford H., 4,477,534, Cl. 428-461.000.
Strong, David C.: *See—*
Clark, David A.; Strong, David C.; and White, Thomas Q., II, 4,477,833, Cl. 358-80.000.
Struble, Kent R., to Minnesota Mining and Manufacturing Company. Stapler. 4,477,008, Cl. 227-19.000.
Strubulis, Vasilios: *See—*
Kessler, Sheldon; and Strubulis, Vasilios, 4,476,973, Cl. 198-744.000.
Struger, Odo J.: *See—*
Schumacher, Gary L.; Struger, Odo J.; and Schultz, Ronald E., 4,477,882, Cl. 364-900.000.
Struthers, Ralph C. Metal/gas fuel cell. 4,477,539, Cl. 429-19.000.
Stubbolo, Louis, to Aire-Wrap, Inc. Insulating air sheath for buildings and the like. 4,476,921, Cl. 165-48.00R.
Stull, Gene. Dispensing cap construction. 4,477,002, Cl. 222-521.000.
Stumpf, Paul G.: *See—*
Nakamura, Robert M.; Mishell, Daniel R.; and Stumpf, Paul G., 4,477,577, Cl. 436-510.000.
Suarato, Antonino; Penco, Sergio; and Arcamone, Federico, to Farmitalia Carlo Erba S.p.A. Antracycline glycosides, pharmaceutical compositions and method of use. 4,477,444, Cl. 424-180.000.
Suda, Shigeyuki; and Ikemori, Keiji, to Canon Kabushiki Kaisha. Ultrawide angle zoom objective. 4,477,153, Cl. 350-426.000.
Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH: *See—*
Fehr, Werner, 4,476,773, Cl. 98-2.080.
Suevia Haiges GmbH & Co.: *See—*
Haiges, Adolf, 4,476,813, Cl. 119-75.000.
Suffis, Robert; and Barchas, Myron, to Mennen Company, The. Cosmetic composition containing high levels of powder. 4,477,431, Cl. 424-66.000.
Suganuma, Noriyuki: *See—*
Fukayama, Miyoji; Suganuma, Noriyuki; and Saruyama, Toshio, 4,477,606, Cl. 523-200.000.
Sugi, Koichiro: *See—*
Ohe, Makoto; and Sugi, Koichiro, 4,477,303, Cl. 156-230.000.
Sugihara, Taizo; Furukawa, Yasuhiko; and Tomioka, Susumu, to Chisso Corporation. Non-woven fabric of hot-melt adhesive composite fibers. 4,477,516, Cl. 428-296.000.
Sugimori, Shigeru; and Kojima, Tetsuhiko, to Chisso Corporation. New high temperature liquid-crystalline substances consisting of 4 or 5 six-member-rings and liquid-crystalline compositions containing same. 4,477,369, Cl. 252-299.600.
Sugita, Masatoshi: *See—*
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,477,437, Cl. 424-116.000.
Sugita, Ryuji; Kanai, Kenji; Sasaki, Seishi; and Takahashi, Ken, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing a magnetic recording medium. 4,477,488, Cl. 427-129.000.
Sugiyama, Hiroyuki, to Victor Company of Japan, Ltd. Color video signal reproducing apparatus. 4,477,839, Cl. 358-326.000.
Sugiyama, Ikuo: *See—*
Usami, Susumu; Teranishi, Nobuyuki; Kuwako, Tomohisa; Sugiyama, Ikuo; Tsujiuchi, Yoshio; and Hara, Shigeo, 4,477,150, Cl. 350-289.000.
Sugiyama, Shuji: *See—*
Takanashi, Akihiro; Hashimoto, Norikazu; Maejima, Hisashi; and Sugiyama, Shuji, 4,477,182, Cl. 355-43.000.
Sullivan, Norman D.: *See—*
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Sumitomo Chemical Company, Limited: *See—*
Saito, Teruo; Asai, Kuniaki; Nakagawa, Isamu; and Kobayashi, Tadayasu, 4,477,630, Cl. 525-133.000.
Sumitomo Electric Industries, Ltd.: *See—*
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Sumiya, Koji, to Aisin Warner Kabushiki Kaisha. Hydraulic governor pressure generator. 4,476,887, Cl. 137-56.000.
Sun, Anthony M.: *See—*
Healy, George M.; Sun, Anthony M.; and Macmorine, Hilda G., 4,477,567, Cl. 435-71.000.
Sunago, Katsuyoshi: *See—*
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Sundstrand Corporation: *See—*
Glennon, Timothy F.; Peterson, William J.; and Thom, James B., 4,477,765, Cl. 322-20.000.
Pollman, Frederic W.; and Crull, Stanley W., 4,476,680, Cl. 60-444.000.
Sung, Rodney L., to Texaco Inc. Polyether amino-amide composition and motor fuel composition containing same. 4,477,261, Cl. 44-63.000.
Sunkist Growers, Inc.: *See—*
Paddock, Paul F.; Krage, William G.; and Conway, Tim D., 4,476,982, Cl. 209-582.000.
Superba S.A.: *See—*
Gloeckler, Alfred, 4,476,696, Cl. 66-75.200.
Superior Electric Company, The: *See—*
De Biasi, Mark S., 4,477,758, Cl. 318-696.000.

Sur-Gard Security Systems Ltd.: *See—*
Saul, Ben; and Hartley, Doug, 4,477,798, Cl. 340-527.000.
Surgikos, Inc.: *See—*
Willcockson, George W., deceased; and Law, David C. F., 4,477,438, Cl. 424-130.000.
Sutter, Leroy V., Jr.; and Cameron, Harold A. Seal formed out of a hard metal with a plating of soft metals. 4,477,087, Cl. 277-26.000.
Sutton, Tonja R.; and Hughes, David W., to Dow Chemical Company, The. Reaction injection molded polyurethanes employing thiapolycyclic polyahls as chain extenders. 4,477,644, Cl. 528-73.000.
Suzuki, Kunihiko, to Nissan Motor Company, Limited. Four-wheel vehicle drive system. 4,476,952, Cl. 180-247.000.
Suzuki, Makoto: *See—*
Nakajima, Takashi; and Suzuki, Makoto, 4,477,686, Cl. 136-203.000.
Suzuki, Sanae: *See—*
Suzuki, Yoshitsugu; Iizuka, Shogo; Kajiyama, Shigeo; Usui, Kenji; Kobayashi, Masahiro; Igura, Toshinori; Kudo, Shigezi; and Suzuki, Sanae, 4,476,629, Ci. 29-863.000.
Suzuki, Satoshi; and Ando, Hiroyuki, to Hitachi, Ltd. Control system for exhaust gas-driven supercharger used in vehicle engine. 4,477,875, Cl. 364-431.080.
Suzuki, Shigeyoshi: *See—*
Yamada, Jun; Senga, Takao; and Suzuki, Shigeyoshi, 4,477,547, Cl. 430-14.000.
Suzuki, Toshio, to Toray Silicone Co., Ltd. Polyorganosiloxane compositions. 4,477,626, Cl. 524-862.000.
Suzuki, Yoshitsugu; Iizuka, Shogo; Kajiyama, Shigeo; Usui, Kenji; Kobayashi, Masahiro; Igura, Toshinori; Kudo, Shigezi; and Suzuki, Sanae, to Yazaki Corporation. Method and apparatus for producing wire harness. 4,476,629, Cl. 29-863.000.
Suzuye and Suzuye: *See—*
Hisaoka, Satoshi; Matsuzaka, Takashi; and Saito, Toshihiko, 4,477,246, Cl. 431-114.000.
Swanson, Eric J., to AT&T Bell Laboratories. Compound current mirror. 4,477,782, Cl. 330-288.000.
Swartzendruber, Ray E., to Chore-Time Equipment, Inc. Adjustable feeder with brood gate. 4,476,811, Cl. 119-52.0AF.
Sway, Boris: *See—*
Sperti, George S.; and Sway, Boris, 4,477,361, Cl. 252-106.000.
Swedblom, Charles E.: *See—*
Frisbee, Belmont, Jr.; and Swedblom, Charles E., 4,477,812, Cl. 343-417.000.
Sweeney, Harold E., to GTE Products Corporation. Short pulse laser. 4,477,905, Cl. 372-25.000.
Sweetana, Andrew S., Jr.: *See—*
Putman, Thomas H.; Sweetana, Andrew S., Jr.; and Brown, Frederick J., 4,477,792, Cl. 336-180.000.
Swidinsky, John A.: *See—*
Petrocine, David V.; and Swidinsky, John A., 4,477,679, Cl. 549-486.000.
Swift, Joseph E. Variable displacement vane type pump. 4,477,231, Cl. 417-221.000.
Sylva, Francis W. Portable water purifier. 4,477,347, Cl. 210-232.000.
Sylvachem Corporation: *See—*
Evans, James M.; Krajca, Kenneth E.; Ukkonen, Keijo A.; and Hansen, James E., 4,477,613, Cl. 524-77.000.
Syntex (U.S.A.) Inc.: *See—*
Waterbury, L. David; and Roszkowski, A. Peter, 4,477,460, Cl. 424-270.000.
Syrnes International B.V.: *See—*
Pons, Dick A.; and Bijker, Anno, 4,477,623, Cl. 524-710.000.
Szlaga, Emil, Jr., to Stant Inc. Filter separator with heater. 4,477,345, Cl. 210-130.000.
Szlam, Aleksander; and Quinn, Chester P., to Melita Electronics Labs, Inc. Apparatus for detecting pick-up at a remote telephone set. 4,477,698, Cl. 179-90.0BD.
Szloboda, David T. Fuel economy device. 4,476,819, Cl. 123-25.00C.
Taenzer, Jon C.; Burch, Donald J.; and Green, Philip S., to SRI International. Ultrasonic imaging with volume flow measuring method and apparatus. 4,476,874, Cl. 128-663.000.
Taflove, Allen: *See—*
Bridges, Jack E.; and Taflove, Allen, 4,476,926, Cl. 166-248.000.
Taira, Kazuo: *See—*
Kojima, Shunji; Katsura, Tadahiko; Ueno, Hiroshi; Taira, Kazuo; and Imatani, Tsuneo, 4,477,501, Cl. 428-35.000.
Taiyo Fishery Co., Ltd.: *See—*
Kagawa, Takahiko; and Sasamoto, Yasuhiko, 4,477,476, Cl. 426-262.000.
Tajima, Akira: *See—*
Tsuji, Sadahiko; and Tajima, Akira, 4,477,148, Cl. 350-286.000.
Takagi, Masasi: *See—*
Nishi, Yasuyuki; Takagi, Masasi; and Sakurai, Masao, 4,476,692, Cl. 62-228.500.
Takahashi, Akio: *See—*
Isogai, Jun; Nakaya, Seiichi; Saitou, Akira; Takahashi, Akio; and Yagi, Isao, 4,477,284, Cl. 106-104.000.
Takahashi, Ichiro: *See—*
Kozuka, Nobuhiko; Koyama, Shigeo; Kai, Masami; Takahashi, Ichiro; Sakata, Hiromi; and Kano, Atsushi, 4,477,173, Cl. 355-3.0DD.
Takahashi, Ken: *See—*
Sugita, Ryuji; Kanai, Kenji; Sasaki, Seishi; and Takahashi, Ken, 4,477,488, Cl. 427-129.000.
Takahashi, Sankichi: *See—*
Otake, Katsumoto; Miyai, Masahiko; Sasaki, Takuya; Mukai, Yasuteru; Takahashi, Sankichi; and Okouchi, Isao, 4,476,917, Cl. 165-1.000.
Takahashi, Teigo: *See—*
Hasebe, Tsutomu; and Takahashi, Teigo, 4,476,779, Cl. 100-7.000.
Takai, Keiji: *See—*
Ueda, Ikuo; Teraji, Tsutomu; Takaya, Takao; Takai, Keiji; Takasugi, Hisashi; Shimojo, Fumio; and Nishino, Shigetaka, 4,477,447, Cl. 424-246.000.
Takanashi, Akihiro; Hashimoto, Norikazu; Maejima, Hisashi; and Sugiyama, Shuji, to Hitachi, Ltd. Pattern exposing apparatus. 4,477,182, Cl. 355-43.000.
Takanashi, Akihiro: *See—*
Kawamura, Yoshio; Takanashi, Akihiro; Kurosaki, Toshiei; Kuniyoshi, Shinji; Hosaka, Sumio; and Terasawa, Tsuneo, 4,477,183, Cl. 355-55.000.
Takaoka, Kazuhiko: *See—*
Koya, Masahiro; Maeda, Narimichi; Ishizuka, Kohei; Takaoka, Kazuhiko; Kokuryo, Yoshiro; and Kita, Yasuhiro, 4,477,913, Cl. 375-13.000.
Takara Company, New York, Inc.: *See—*
Yoshiyuji, Hidetoshi, 4,477,201, Cl. 403-231.000.
Takasugi, Hisashi: *See—*
Ueda, Ikuo; Teraji, Tsutomu; Takaya, Takao; Takai, Keiji; Takasugi, Hisashi; Shimojo, Fumio; and Nishino, Shigetaka, 4,477,447, Cl. 424-246.000.
Takata, Toshiaki: *See—*
Tomita, Tetsuo; Jono, Masahiro; and Takata, Toshiaki, 4,477,682, Cl. 568-362.000.
Takatsuka, Toru: *See—*
Gomi, Shimpei; Takeuchi, Tomomitsu; Matsuo, Itaru; Fujii, Masaki; Takatsuka, Toru; and Watari, Ryuzo, 4,477,334, Cl. 208-75.000.
Takaya, Takao: *See—*
Ueda, Ikuo; Teraji, Tsutomu; Takaya, Takao; Takai, Keiji; Takasugi, Hisashi; Shimojo, Fumio; and Nishino, Shigetaka, 4,477,447, Cl. 424-246.000.
Takeda, Hirofumi, to Fujitsu Limited. Emitter-coupled logic circuit device. 4,477,740, Cl. 307-455.000.
Takeda Riken Kogyo Kabushikikaisha: *See—*
Tojo, Shigeki, 4,477,770, Cl. 324-57.00N.
Takei, Yoshiaki: *See—*
Fujimaki, Yoshihide; Takei, Yoshiaki; and Nomori, Hiroyuki, 4,477,549, Cl. 430-54.000.
Takemura, Tetsuo: *See—*
Kato, Takao; and Takemura, Tetsuo, 4,477,899, Cl. 370-94.000.
Takemura, Yasuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Solid-state color image pickup device N. 4,477,832, Cl. 358-44.000.
Takenaka, Shinya: *See—*
Hiramoto, Junichi; Takenaka, Shinya; and Sunago, Katsuyoshi, 4,477,768, Cl. 324-51.000.
Takeno, Ryuko: *See—*
Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,664, Cl. 544-360.000.
Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,666, Cl. 544-385.000.
Takeuchi, Tomio: *See—*
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; Iwamoto, Hidenori; and Sakamoto, Shuichi, 4,477,443, Cl. 424-180.000.
Takeuchi, Tomomitsu: *See—*
Gomi, Shimpei; Takeuchi, Tomomitsu; Matsuo, Itaru; Fujii, Masaki; Takatsuka, Toru; and Watari, Ryuzo, 4,477,334, Cl. 208-75.000.
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, to Toyama Chemical Co., Ltd. Substances having carcinostatic and immunostimulating activity. 4,477,437, Cl. 424-116.000.
Tamaura, Yutaka: *See—*
Abe, Masanori; and Tamaura, Yutaka, 4,477,319, Cl. 204-56.00R.
Tamura, Masahide; and Daisuke, Koga, to Toyo Communication Equipment Co., Ltd. Semi-coaxial cavity resonator filter. 4,477,786, Cl. 333-207.000.
Tanaka, Akihiro: *See—*
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; Iwamoto, Hidenori; and Sakamoto, Shuichi, 4,477,443, Cl. 424-180.000.
Tanaka, Hiroaki; and Akita, Shigeyuki, to Nippon Soken, Inc. Capacity type rotation detecting apparatus. 4,477,810, Cl. 340-870.370.
Tanaka, Shinsuke: *See—*
Ota, Chuichi; Imamura, Nobutake; and Tanaka, Shinsuke, 4,477,852, Cl. 360-114.000.
Taniguchi, Nobuyuki: *See—*
Matsumoto, Toshiaki; and Taniguchi, Nobuyuki, 4,477,163, Cl. 354-173.110.
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,477,164, Cl. 354-286.000.
Tanikawa, Kiyoshi: *See—*
Oba, Hideaki; Kunikane, Makoto; Umehara, Masaakira; Tanikawa, Kiyoshi; and Abe, Michiharu, 4,477,555, Cl. 430-273.000.

Tanner, Nicholas J., to Wes Ltd. Storage and transport containers. 4,476,988, Cl. 220-1.500.

Tano, Kazuhiro: *See*—
Higuchi, Seizun; Tano, Kazuhiro; Kamada, Minoru; and Okamoto, Susumu, 4,476,805, Cl. 118-65.000.

Tarasov, Alexandr E.: *See*—
Ivanov, Jury P.; Averbukh, Anatoly B.; Evstafiev, Evgeny A.; and Tarasov, Alexandr E., 4,476,797, Cl. 114-65.00R.

Tashiro, Yoshizo: *See*—
Yamanashi, Fumiaki; Hayashi, Yuzo; Kano, Mitsuru; Fujiwara, Yoshiyuki; and Tashiro, Yoshizo, 4,477,368, Cl. 252-299.100.

Tatsuguchi, Kazuo: *See*—
Kinjo, Hisao; and Tatsuguchi, Kazuo, 4,477,843, Cl. 358-342.000.

Tauch, Franz. Air filter. 4,477,270, Cl. 55-316.000.

Taufen, Paul M., to Texasgulf, Inc. Sulphur gas geochemical prospecting. 4,477,573, Cl. 436-33.000.

Taylor, Carl D., to General Electric Company. Orientable twistlock receptacle. 4,477,143, Cl. 339-126.0RS.

TDK Corporation: *See*—
Nakajima, Takashi; and Suzuki, Makoto, 4,477,686, Cl. 136-203.000.

Technar Incorporated: *See*—
Bell, Lon E.; and Gruber, William P., 4,477,715, Cl. 219-205.000.

Tektronix, Inc.: *See*—
Park, Hee K.; and Yamaguchi, Tadanori, 4,477,310, Cl. 156-643.000.

Teledyne Industries, Inc.: *See*—
Leblanc, Raymond F.; and Cummins, William T., 4,477,302, Cl. 156-165.000.
Pust, Harold W., 4,477,403, Cl. 264-104.000.

Telezhnikov, Jury F.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Turutin, Veniamin S.; Bezchastnov, Gennady A.; and Telezhnikov, Jury F., 4,477,690, Cl. 174-15.00C.

Tenland, Jan T.: *See*—
Nilsson, Gert E.; Tenland, Jan T.; and Oberg, Per A., 4,476,875, Cl. 128-666.000.

Teraji, Tsutomu: *See*—
Ueda, Ikuo; Teraji, Tsutomu; Takaya, Takao; Takai, Keiji; Takasugi, Hisashi; Shimojo, Fumio; and Nishino, Shigetaka, 4,477,447, Cl. 424-246.000.

Teranishi, Nobuyuki: *See*—
Usami, Susumu; Teranishi, Nobuyuki; Kuwako, Tomohisa; Sugiyama, Ikuo; Tsujiuchi, Yoshio; and Hara, Shigeo, 4,477,150, Cl. 350-289.000.

Terasawa, Tsuneo: *See*—
Kawamura, Yoshio; Takanashi, Akihiro; Kurosaki, Toshiei; Kuniyoshi, Shinji; Hosaka, Sumio; and Terasawa, Tsuneo, 4,477,183, Cl. 355-55.000.

Terauchi, Kiyoshi, to Sanden Corporation. Scroll type compressor with wrap portions of different axial heights. 4,477,238, Cl. 418-5.000.

Terui, Nobuhiko; Watanabe, Sakuji; and Meguro, Hiroshi, to Nippon Kogaku K.K. Automatic focusing camera system and photographing lens structure therefor. 4,477,169, Cl. 354-409.000.

Terumo Kabushiki Kaisha: *See*—
Uchiyama, Taizo, 4,476,876, Cl. 128-682.000.

Teshima, Takanori: *See*—
Akita, Yoshio; Teshima, Takanori; Torii, Koshi; and Maruyama, Toshinori, 4,477,766, Cl. 322-28.000.

Tetsuo, Kato, to Tokico Ltd. Hydraulic damper. 4,476,967, Cl. 188-319.000.

Teutsch, Jean G.: *See*—
Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, 4,477,445, Cl. 424-239.000.

Texaco Inc.: *See*—
Sung, Rodney L., 4,477,261, Cl. 44-63.000.

Texas Turbine, Inc.: *See*—
Giroux, Claude, 4,477,223, Cl. 415-169.00R.

Texasgulf, Inc.: *See*—
Taufen, Paul M., 4,477,573, Cl. 436-33.000.

Tezel, Jirayr. Combined multiple punch and single punch hair transplant cutting device. 4,476,864, Cl. 128-305.100.

Tezuka Kosan Kabushiki Kaisha: *See*—
Hasebe, Tsutomu; and Takahashi, Teigo, 4,476,779, Cl. 100-7.000.

Thal, Herbert L., Jr., to United States of America, Air Force. Dual mode directionally coupled band reject filter apparatus. 4,477,787, Cl. 333-208.000.

Thaler, Arnold; Friedson, David; and Kin, Lai, to Windmere Corporation. Flocked curling iron. 4,477,716, Cl. 219-225.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Ballast tamping machine. 4,476,786, Cl. 104-12.000.

Thibeault, Claude E.: *See*—
Feder, Ernest; and Thibeault, Claude E., 4,477,086, Cl. 277-26.000.

Thiel, Patrick L.; Lawry, Clifford F.; and DeNeef, John G., to Westinghouse Electric Corp. Spacer block pattern for electrical inductive apparatus. 4,477,791, Cl. 336-60.000.

Thom, James B.: *See*—
Glennon, Timothy F.; Peterson, William J.; and Thom, James B., 4,477,765, Cl. 322-20.000.

Thomas, Erwin: *See*—
Grosskinsky, Otto-Alfred; Frommer, Elmar; Rapp, Gunther; and Thomas, Erwin, 4,477,424, Cl. 423-387.000.

Thomas Industries, Inc.: *See*—
Grubbs, Calvin E., 4,477,748, Cl. 315-306.000.

Thomas J. Lipton, Inc.: *See*—
Tiberio, Jeanne E.; and Cirigliano, Michael C., 4,477,478, Cl. 426-330.600.

Thomas, O. Leon: *See*—
Lowery, James O.; Thomas, O. Leon; Baston, Nathan I.; Smith, Darrell L.; Jiles, Walter K.; and Starnes, R. Emory, Jr., 4,477,769, Cl. 324-54.000.

Thomas, Wilbur R.; Hickman, Fred E., III; and Knight, George J., to Westinghouse Electric Corp. Flexibilized flame retardant B-staged epoxy resin prepregs and composite laminates made therefrom. 4,477,512, Cl. 428-236.000.

Thompson, David L., to Medtronic, Inc. Body stimulator output circuit. 4,476,868, Cl. 128-419.0PG.

Thompson, James E.; Sandvik, Leonard E.; and Elliott, Marc A., to Deere & Company. Multi-directional vibration attenuator seat. 4,477,050, Cl. 248-636.000.

Thomson-CSF: *See*—
Berger, Jean L.; and Descure, Pierrick, 4,477,835, Cl. 358-213.000.
Maerfeld, Charles; and Lardat, Claude, 4,477,784, Cl. 333-153.000.

Thoratec Laboratories Corporation: *See*—
Baker, Kenneth J.; Buck, Keith E.; Chase, Irving C.; Fraser, Robert B.; and Miles, Clive, 4,476,708, Cl. 73-23.000.

Thorsrud, Lee T., to Sperry Corporation. Parity generation/detection logic circuit from transfer gates. 4,477,904, Cl. 371-49.000.

Thumm, Manfred: *See*—
Walker, John C.; and Thumm, Manfred, 4,477,827, Cl. 357-70.000.

Tiberio, Jeanne E.; and Cirigliano, Michael C., to Thomas J. Lipton, Inc. Acid preservation systems for food products. 4,477,478, Cl. 426-330.600.

Tigreat, Paul: *See*—
Berger, Laurent; and Tigreat, Paul, 4,477,185, Cl. 356-152.000.

Tilton, Robert W., to GSW Inc. Method and apparatus for manufacturing a foam insulated water heater. 4,477,399, Cl. 264-45.200.

Timmis, John P., to Lucas Industries Limited. Link and windscreen wiper mechanism. 4,477,293, Cl. 148-31.500.

Titan Tool Company: *See*—
McKean, John A., 4,476,749, Cl. 81-53.200.

Togano, Shigeo: *See*—
Matsufuji, Yohji; Togano, Shigeo; and Ichihashi, Hiroo, 4,477,823, Cl. 346-140.00R.

Tojo, Shigeki, to Takeda Riken Kogyo Kabushikikaisha. Noise field intensity measuring apparatus. 4,477,770, Cl. 324-57.00N.

Tokico Ltd.: *See*—
Hayashida, Yoshihiro, 4,477,122, Cl. 303-6.00C.
Sega, Masahisa; and Kikuchi, Akira, 4,477,221, Cl. 414-735.000.
Tetsuo, Kato, 4,476,967, Cl. 188-319.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Iwahashi, Hiroshi; and Asano, Masamichi, 4,477,884, Cl. 365-189.000.
Ozu, Masao, 4,476,691, Cl. 62-217.000.
Rifu, Toshihiro, 4,477,728, Cl. 250-385.000.
Takemura, Yasuo, 4,477,832, Cl. 358-44.000.
Wada, Masashi, 4,477,883, Cl. 365-185.000.

Tomaszewski, Thaddeus W., to OMI International Corporation. Trivalent chromium electrolyte and process employing reducing agents. 4,477,315, Cl. 204-1.500.

Tomaszewski, Thaddeus W., to OMI International Corporation. Trivalent chromium electrolyte and process employing metal ion reducing agents. 4,477,318, Cl. 204-51.000.

Tomioka, Susumu: *See*—
Sugihara, Taizo; Furukawa, Yasuhiko; and Tomioka, Susumu, 4,477,516, Cl. 428-296.000.

Tomita, Tetsuo; Jono, Masahiro; and Takata, Toshiaki, to Mitsubishi Gas Chemical Company, Inc. Process for producing 4-hydroxy-2,4,6-trimethylcyclohexa-2,5-diene-1-one. 4,477,682, Cl. 568-362.000.

Tomlinson, Roderick P. J., to Lockley Services Pty. Ltd.; Barry, Graham Charles; and Field, Norman John, a part interest. Sheet printed with invisible inks, developers and erasure compounds for invisible inks. 4,477,593, Cl. 346-205.000.

Tomono, Makoto: *See*—
Haneda, Satoshi; Tomono, Makoto; and Itaya, Masahiko, 4,477,174, Cl. 355-3.0DD.

Topalian, Harry H.: *See*—
Saladini, Joseph J.; Parnell, John V., III; Steensen, Wayne L.; and Topalian, Harry H., 4,477,474, Cl. 426-250.000.

Toray Silicone Co., Ltd.: *See*—
Fukayama, Miyoji; Suganuma, Noriyuki; and Saruyama, Toshio, 4,477,606, Cl. 523-200.000.
Suzuki, Toshio, 4,477,626, Cl. 524-862.000.

Torgow, Abraham M. Game apparatus. 4,477,078, Cl. 273-122.00A.

Torii, Koshi: *See*—
Akita, Yoshio; Teshima, Takanori; Torii, Koshi; and Maruyama, Toshinori, 4,477,766, Cl. 322-28.000.

Torregrosa, Michel: *See*—
Chorel, Jacques; Migeon, Andre ; and Torregrosa, Michel, 4,476,725, Cl. 73-704.000.

Tortellier, Christian, to Manutis. Platform lifting device mounted on a motor vehicle. 4,476,959, Cl. 187-9.00R.

Toshiba Silicone Co., Ltd.: *See*—
Matsumoto, Yasuji, 4,477,641, Cl. 528-15.000.

Tosima, Soitiro; and Nishikawa, Masayoshi, to RCA Corporation. Surface acoustic wave device having a pyramid shaped tip for recording video information on a substrate. 4,477,892, Cl. 369-132.000.

Toth, Jozsef T.: *See*—
Matyasi, Jozsef; Kaptay, Gyorgy; Zsembery, Laszlo ; Kokeny, Bela; Toth, Jozsef T.; Toth Nee Homostrei, Maria; and Penzes, Imre, 4,477,427, Cl. 423-628.000.
Toth Nee Homostrei, Maria: *See*—
Matyasi, Jozsef; Kaptay, Gyorgy; Zsembery, Laszlo ; Kokeny, Bela; Toth, Jozsef T.; Toth Nee Homostrei, Maria; and Penzes, Imre, 4,477,427, Cl. 423-628.000.
Towmotor Corporation: *See*—
Yarris, William T., 4,476,960, Cl. 187-9.00E.
Toy, James W.: *See*—
Casper, Paul W.; Toy, James W.; Orlando, Fred J., Jr.; and Giri, Ronald R., 4,477,895, Cl. 370-16.000.
Toyama Chemical Co., Ltd.: *See*—
Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,664, Cl. 544-360.000.
Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,666, Cl. 544-385.000.
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,477,437, Cl. 424-116.000.
Toyo Communication Equipment Co., Ltd.: *See*—
Tamura, Masahide; and Daisuke, Koga, 4,477,786, Cl. 333-207.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Kojima, Shunji; Katsura, Tadahiko; Ueno, Hiroshi; Taira, Kazuo; and Imatani, Tsuneo, 4,477,501, Cl. 428-35.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Fujimoto, Teruo, 4,477,596, Cl. 521-25.000.
Toyoda, Yukio: *See*—
Ohki, Yoshimasa; Toyoda, Yukio; Kobayashi, Hiroyuki; and Akasaki, Isamu, 4,476,620, Cl. 29-569.00L.
Toyofuku, Yasumasa: *See*—
Ukai, Nobuo; Kawano, Nagahiro; Toyofuku, Yasumasa; and Nakamura, Akira, 4,476,670, Cl. 56-328.00R.
Toyota Jidosha Kabushiki Kaisha: *See*—
Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, 4,476,739, Cl. 74-475.000.
Haga, Shozi; and Nozaki, Tadashi, 4,476,738, Cl. 74-475.000.
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,477,392, Cl. 261-39.00A.
Shinoda, Kazuo; and Isobe, Toshiaki, 4,476,831, Cl. 123-480.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ida, Shuichiro; Ooshima, Shoichi; Horiuchi, Ichiro; and Nishu, Mitsufumi, 4,476,740, Cl. 74-476.000.
Ito, Hiroshi, 4,476,970, Cl. 192-0.052.
Kobayashi, Nobuyuki; and Ito, Hiroshi, 4,476,828, Cl. 123-339.000.
Tragatschnig, Jorg: *See*—
Hochreuther, Karl; and Tragatschnig, Jorg, 4,476,721, Cl. 73-431.000.
Tread Corporation: *See*—
Frantz, James S., 4,477,130, Cl. 312-219.000.
Treslo, Nicholas. Keyless lock. 4,476,698, Cl. 70-25.000.
Troponwerke GmbH & Co. KG: *See*—
Boltze, Karl-Heinz; and Lehnen, Hans D., 4,477,677, Cl. 548-501.000.
Trumbull, Douglas, to Showscan Film Corporation. Motion picture system. 4,477,160, Cl. 352-40.000.
TRW Inc.: *See*—
Asawa, Charles K.; Austin, Joseph W.; Barnoski, Michael K.; Jackson, Allan R.; Personick, Stewart D.; and Yao, Shi-Kay, 4,477,725, Cl. 250-231.00R.
Jones, Robert J.; and Chang, Glenn E. C., 4,477,648, Cl. 528-185.000.
Tsuchiya, Tsutomu: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; Iwamoto, Hidenori; and Sakamoto, Shuichi, 4,477,443, Cl. 424-180.000.
Tsuda, Hisatsugu: *See*—
Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,664, Cl. 544-360.000.
Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,666, Cl. 544-385.000.
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,477,437, Cl. 424-116.000.
Tsuda, Koichi: *See*—
Mukae, Kazuo; Maruyama, Satoshi; Tsuda, Koichi; and Nagasawa, Ikuo, 4,477,793, Cl. 338-21.000.
Tsudakoma Corporation: *See*—
Sainen, Tsutomu, 4,476,901, Cl. 139-370.200.
Tsugahara, Takatoshi: *See*—
Asakura, Noboru; Yanagawa, Motoo; and Tsugahara, Takatoshi, 4,477,115, Cl. 296-1.00S.
Tsuji, Sadahiko; and Tajima, Akira, to Canon Kabushiki Kaisha. Optical low-pass filter. 4,477,148, Cl. 350-286.000.
Tsujiuchi, Yoshio: *See*—
Usami, Susumu; Teranishi, Nobuyuki; Kuwako, Tomohisa; Sugiyama, Ikuo; Tsujiuchi, Yoshio; and Hara, Shigeo, 4,477,150, Cl. 350-289.000.
Tsukasaki, Yasuhiro, to Kabushiki Kaisha Shinko Kikai Seisakusho. Device of securing a film bearing indicia on the printing roll under tension. 4,476,783, Cl. 101-415.100.
Tsukihoshi Kasei Kabushiki Kaisha: *See*—
Ukai, Nobuo; Kawano, Nagahiro; Toyofuku, Yasumasa; and Nakamura, Akira, 4,476,670, Cl. 56-328.00R.
Tsunehiro, Yuzuru: *See*—
Asano, Katsuhiro; and Tsunehiro, Yuzuru, 4,477,763, Cl. 318-811.000.
Tsuruoka, Kanji: *See*—
Sano, Shigeru; Sakurai, Katsumi; Ono, Tatsuo; Tsuruoka, Kanji; and Watanabe, Masaru, 4,477,708, Cl. 219-10.670.
Tsuyama Manufacturing Company, Ltd.: *See*—
Tsuyama, Sadaharu, 4,477,865, Cl. 362-396.000.
Tsuyama, Sadaharu, to Tsuyama Manufacturing Company, Ltd. Mounting device for lighting device for bicycle. 4,477,865, Cl. 362-396.000.
Tucker, Alfred D., to Ris Irrigation Systems Pty. Limited. Filter backwash means. 4,477,343, Cl. 210-108.000.
Tunamatic Handelsbolag: *See*—
Nilsson, Rolf; and Lindstrom, Nils-Georg, 4,477,101, Cl. 280-461.00A.
Tung, Raymond T.: *See*—
Gibson, John M.; Poate, John M.; and Tung, Raymond T., 4,477,308, Cl. 156-603.000.
Turutin, Veniamin S.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Turutin, Veniamin S.; Bezchastnov, Gennady A.; and Telezhnikov, Jury F., 4,477,690, Cl. 174-15.00C.
Tuznik, Franciszek S.: *See*—
Olszewski, Witold; Lis, Andrzej; Pietraszek, Pawel; and Tuznik, Franciszek S., 4,477,344, Cl. 210-109.000.
Uchida, Kimio: *See*—
Karasawa, Kohichi; Itoh, Takeo; Koizumi, Humihito; and Uchida, Kimio, 4,477,045, Cl. 248-1.000.
Uchiyama, Taizo, to Terumo Kabushiki Kaisha. Electronic sphygmomanometer. 4,476,876, Cl. 128-682.000.
Ueda, Ikuo; Teraji, Tsutomu; Takaya, Takao; Takai, Keiji; Takasugi, Hisashi; Shimojo, Fumio; and Nishino, Shigetaka, to Fujisawa Pharmaceutical Co., Ltd. 7-Acylaminocephalosporanic acid derivatives. 4,477,447, Cl. 424-246.000.
Uehara, Masafumi: *See*—
Yamamoto, Takeshi; Goto, Kiyoshi; and Uehara, Masafumi, 4,477,553, Cl. 430-192.000.
Ueno, Hiroshi: *See*—
Kojima, Shunji; Katsura, Tadahiko; Ueno, Hiroshi; Taira, Kazuo; and Imatani, Tsuneo, 4,477,501, Cl. 428-35.000.
Ukai, Nobuo; Kawano, Nagahiro; Toyofuku, Yasumasa; and Nakamura, Akira, to Tsukihoshi Kasei Kabushiki Kaisha. Speed-slowing conveying tool for fruits and the like. 4,476,670, Cl. 56-328.00R.
Ukkonen, Keijo A.: *See*—
Evans, James M.; Krajca, Kenneth E.; Ukkonen, Keijo A.; and Hansen, James E., 4,477,613, Cl. 524-77.000.
Ulmer, Richard W.; and Whatley, Roger A., to Motorola, Inc. Voltage generator circuit having compensation for process and temperature variation. 4,477,737, Cl. 307-297.000.
Umeda, Hiroyuki: *See*—
Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki, 4,477,850, Cl. 360-94.000.
Umehara, Masaakira: *See*—
Oba, Hideaki; Kunikane, Makoto; Umehara, Masaakira; Tanikawa, Kiyoshi; and Abe, Michiharu, 4,477,555, Cl. 430-273.000.
Umesaki, Shigeo: *See*—
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Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; Iwamoto, Hidenori; and Sakamoto, Shuichi, to Zaidan Hojin Biselbutsu Kagaku Kenkyu Kai (Microbial Chemistry Research Foundation). Tylosin derivatives, their preparation and pharmaceutical compositions containing them. 4,477,443, Cl. 424-180.000.
Umezawa, Sumio: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; Iwamoto, Hidenori; and Sakamoto, Shuichi, 4,477,443, Cl. 424-180.000.
Umezu, Nobuhiko: *See*—
Yamamoto, Masanobu; and Umezu, Nobuhiko, 4,477,821, Cl. 346-108.000.
Unified Technologies, Inc.: *See*—
Benfield, Sherwood G., 4,476,855, Cl. 126-426.000.
Union Carbide Corporation: *See*—
Agrawal, Balkishan, 4,477,278, Cl. 75-51.000.
Akridge, James R.; and Vourlis, Harry, 4,477,545, Cl. 429-191.000.
Goddard, John B., 4,477,416, Cl. 423-67.000.
Mullhaupt, Joseph T.; and Berwaldt, Oren E., 4,477,418, Cl. 423-219.000.
Union Oil Company of California: *See*—
Watanabe, David J., 4,476,930, Cl. 166-279.000.

Unionelecs Kabushiki Kaisha: *See*—
Yasufuku, Shouji, 4,477,193, Cl. 368-24.000.
Uniroyal, Inc.: *See*—
Sperley, Richard J., 4,477,611, Cl. 524-71.000.
United Kingdom Atomic Energy Authority: *See*—
Hindle, Edward D., 4,477,411, Cl. 376-412.000.
Parkinson, Kenneth; and Kennedy, Peter, 4,477,493, Cl. 427-228.000.
United States of America
Agriculture: *See*—
Chen, George C.; and Rowell, Roger M., 4,477,389, Cl. 260-453.0PH.
Serota, Samuel; and Linfield, Warner M., 4,477,384, Cl. 260-410.90R.
Air Force: *See*—
Brumbaugh, Charles T.; Pittenger, Robert L.; and Klees, Robert M., 4,477,814, Cl. 343-725.000.
Comer, Matthew R., 4,477,152, Cl. 350-394.000.
Lubasiewski, Stephen E.; and Haggenmiller, Christian, 4,476,806, Cl. 118-110.000.
O'Driscoll, Peter F.; Crowe, Gerald E.; and Berry, John, 4,477,024, Cl. 239-265.110.
Plank, Vernon G.; Crist, Stephen D.; and LaGross, Dennis L., 4,476,718, Cl. 73-171.000.
Repperger, Daniel W., 4,477,043, Cl. 244-223.000.
Salvi, Theodore C.; Smithers, Martin E.; and Dente, Gregory C., 4,477,909, Cl. 372-95.000.
Thal, Herbert L., Jr., 4,477,787, Cl. 333-208.000.
Wolf, Daniel S., 4,477,222, Cl. 415-138.000.
Zimmerschied, Alan B., 4,476,710, Cl. 73-35.000.
Army: *See*—
Gutierrez, William A.; and Wilson, Herbert L., 4,477,294, Cl. 148-171.000.
Nagumo, George; Miller, Donald A.; and Lieberman, Paul, 4,477,888, Cl. 367-152.000.
Rozniecki, Edward J., 4,476,937, Cl. 169-26.000.
Energy: *See*—
Fraioli, Anthony V., 4,477,541, Cl. 429-33.000.
Piltch, Martin S., 4,477,746, Cl. 315-39.000.
Smith, Jay E., 4,477,731, Cl. 250-506.100.
Health and Human Services: *See*—
Peterson, John I.; and Fitzgerald, Raphael V., 4,476,870, Cl. 128-634.000.
Navy: *See*—
Clarke, Robert L., 4,477,538, Cl. 428-656.000.
Eng, Berwyn S.; and Christian, Earl L., 4,476,654, Cl. 51-26.000.
Frisbee, Belmont, Jr.; and Swedblom, Charles E., 4,477,812, Cl. 343-417.000.
Keller, Teddy M., 4,477,643, Cl. 528-70.000.
Malvick, David L., 4,477,818, Cl. 343-881.000.
Mortlock, Clarence E.; Brady, Joseph A.; and Shapiro, Marvin, 4,477,845, Cl. 360-26.000.
Reed, Robert W., 4,477,779, Cl. 328-151.000.
Reuss, Max L., Jr., 4,477,781, Cl. 330-286.000.
U.S. Philips Corporation: *See*—
Bjorklund, Jan M. V., 4,477,543, Cl. 429-115.000.
Broeksema, Egbert; and Smeets, Arnoldus A., 4,477,328, Cl. 204-159.230.
Chung, Kah-Seng, 4,477,916, Cl. 375-60.000.
Gumbert, Hans; and Eufinger, Norbert, 4,476,626, Cl. 29-740.000.
Hagemann, Hans J.; Hunten, Siegfried; Wernicke, Rolf; Klomp, Cornelius J.; and Noorlander, Willem, 4,477,401, Cl. 264-61.000.
Janssen, Petrus J.; and van der Hulst, Victor A., 4,477,274, Cl. 65-13.000.
Lindman, Nils T.; Fransson, Lars H.; and Pott, Carl C., 4,477,830, Cl. 358-1.000.
Peters, Joseph H., 4,477,915, Cl. 375-30.000.
Schmale, Peter C., 4,477,749, Cl. 315-397.000.
Schouhamer Immink, Kornelis A.; and Vries, Lodewijk B., 4,477,903, Cl. 371-37.000.
van den Enden, Adrianus W. M.; van Mil, Job F. P.; and Nijman, Aloysius J., 4,477,696, Cl. 179-18.0BC.
United Technologies Corporation: *See*—
Feder, Ernest; and Thibeault, Claude E., 4,477,086, Cl. 277-26.000.
Kesten, Arthur S., 4,476,918, Cl. 165-1.000.
Pearson, James E., 4,477,720, Cl. 250-201.000.
Picard, Harrison R., 4,477,088, Cl. 277-83.000.
Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., 4,477,876, Cl. 364-434.000.
Unitika Limited: *See*—
Kudo, Kazushige; Yamamoto, Shigeo; and Murase, Shigemitsu, 4,477,497, Cl. 427-386.000.
Univablot: *See*—
Astoin, Jacques N.; Lepage, Francis; and Fromantin, Jean-Pierre M. J., 4,477,453, Cl. 424-250.000.
Universal Pioneer Corporation: *See*—
Akiyama, Toru, 4,477,838, Cl. 358-322.000.
University of Delaware, The: *See*—
Barnett, Allen M.; Catalano, Anthony W.; Dalal, Vikram L.; Masi, James V.; Meakin, John D.; and Hall, Robert B., 4,477,688, Cl. 136-258.000.
University of Kentucky Research Foundation: *See*—
Kao, David T., 4,476,771, Cl. 92-78.000.
University of Rochester: *See*—
Zawadzkas, Gerald A.; and Chou, Mau-Song, 4,477,710, Cl. 219-117.100.
University of Southern California: *See*—
Nakamura, Robert M.; Mishell, Daniel R.; and Stumpf, Paul G., 4,477,577, Cl. 436-510.000.
University Patents, Inc.: *See*—
Pettit, Donald R.; and Peterson, Thomas W., 4,477,187, Cl. 356-335.000.
UOP Inc.: *See*—
Carson, Don B., 4,477,413, Cl. 422-62.000.
Upjohn Company, The: *See*—
Bundy, Gordon L., 4,477,684, Cl. 568-379.000.
Heckler, Jay W., 4,477,468, Cl. 424-317.000.
Skulnick, Harvey I.; and Renis, Harold E., 4,477,442, Cl. 424-180.000.
Urani, Angelo, to McGraw-Edison Company. Shock proof fuseholder. 4,477,139, Cl. 339-88.00R.
Urano, Fumio: *See*—
Kawasaki, Masahiro; Okura, Zenichi; and Urano, Fumio, 4,477,161, Cl. 354-448.000.
Urban, John A.; and Sherrick, Peter L., to Eaton Corporation. Expanding shoe drum brake. 4,476,968, Cl. 188-329.000.
Usami, Susumu; Teranishi, Nobuyuki; Kuwako, Tomohisa; Sugiyama, Ikuo; Tsujiuchi, Yoshio; and Hara, Shigeo, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Electric remote control rearview mirror. 4,477,150, Cl. 350-289.000.
Ushiro, Keiji: *See*—
Kawasaki, Haruhiko; and Ushiro, Keiji, 4,476,890, Cl. 137-269.000.
Usui, Kenji: *See*—
Suzuki, Yoshitsugu; Iizuka, Shogo; Kajiyama, Shigeo; Usui, Kenji; Kobayashi, Masahiro; Igura, Toshinori; Kudo, Shigezi; and Suzuki, Sanae, 4,476,629, Cl. 29-863.000.
Usui, Masaji; and Honma, Akiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Portective relay with second harmonic suppression. 4,477,854, Cl. 361-36.000.
USV Pharmaceutical Corporation: *See*—
Auerbach, Joseph; and Golec, Frederick A., Jr., 4,477,675, Cl. 548-480.000.
Jones, Howard; and Coutts, Stephen M., 4,477,446, Cl. 424-244.000.
Uya, Masaru; and Kawamoto, Kinji, to Matsushita Electric Industrial Co., Ltd. Electronic musical instrument. 4,476,763, Cl. 84-1.030.
Van De Motter, Charles P.; Hamm, Steven J.; and Van De Motter, Christopher C., to Ohio Broach & Machine Company, The. Infeed shuttle table for vertical broach. 4,477,216, Cl. 409-257.000.
Van De Motter, Christopher C.: *See*—
Van De Motter, Charles P.; Hamm, Steven J.; and Van De Motter, Christopher C., 4,477,216, Cl. 409-257.000.
Vandenbergh, Peter A.: *See*—
Colaruotolo, Joseph F.; Olsen, Ronald H.; and Vandenbergh, Peter A., 4,477,570, Cl. 435-253.000.
van den Bosch, Steven; Kettenes, Dirk K.; de Ross, Kris B.; Sipma, Gerben; and Stoffelsma, Jan, to P.F.W. Beheer B.V. Sulfur-containing flavoring agents. 4,477,678, Cl. 549-62.000.
van den Enden, Adrianus W. M.; van Mil, Job F. P.; and Nijman, Aloysius J., to U.S. Philips Corporation. Conference system for telephony. 4,477,696, Cl. 179-18.0BC.
van der Hulst, Harm; Pogany, George A.; and Kuyper, Jan, to Shell Oil Company. Catalysts for the polymerization of epoxides and process for the preparation of such catalysts. 4,477,589, Cl. 502-169.000.
van der Hulst, Victor A.: *See*—
Janssen, Petrus J.; and van der Hulst, Victor A., 4,477,274, Cl. 65-13.000.
van der Lely, Ary; and Bom, Cornelis J. G., to C. Van der Lely N.V. Mowing machine. 4,476,666, Cl. 56-13.600.
Van de Sande, Christian C.; and Verhecken, Andre, to Agfa-Gevaert, N.V. Diffusion transfer material and process. 4,477,554, Cl. 430-223.000.
Van Duyn, Paul D.; and Johnson, Jerry J., Sr., to General Motors Corporation. Lamp assembly. 4,477,864, Cl. 362-311.000.
van Mil, Job F. P.: *See*—
van den Enden, Adrianus W. M.; van Mil, Job F. P.; and Nijman, Aloysius J., 4,477,696, Cl. 179-18.0BC.
van Oene, Henk: *See*—
Cassatta, Joseph C.; Garrett, David L., Jr.; and van Oene, Henk, 4,477,327, Cl. 204-159.150.
Varco International, Inc.: *See*—
Boyadjieff, George I.; and Campbell, Andrew B., 4,476,936, Cl. 166-383.000.
Varian Associates, Inc.: *See*—
Alfredson, Thomas V., 4,476,713, Cl. 73-61.10C.
Yang, Frank J., 4,476,732, Cl. 73-863.730.
Yang, Frank J.; and Hinshaw, John V., Jr., 4,477,266, Cl. 55-67.000.
Vaughn, Howard A., Jr.: *See*—
Doin, James E.; and Vaughn, Howard A., Jr., 4,477,499, Cl. 427-412.100.
Veber, Daniel F.: *See*—
Boger, Joshua S.; and Veber, Daniel F., 4,477,440, Cl. 424-177.000.
Boger, Joshua S.; and Veber, Daniel F., 4,477,441, Cl. 424-177.000.
Veliky, Ivan A.: *See*—
Schneider, Henry; Maleszka, Ryszard; Wang, Patrick Y.; Veliky, Ivan A.; and Chan, Yui-Kwok, 4,477,569, Cl. 435-161.000.
Venture Technology, Inc.: *See*—
Lieb, Nathaniel H.; Alderman, Albert D., Jr.; and Alago, James L., 4,477,252, Cl. 433-29.000.
Verboom, Gilles M. L.; Bliznik, Kenneth E.; and Welsh, Thomas L., to Miles Laboratories, Inc. Caustic based aqueous cleaning composition. 4,477,365, Cl. 252-156.000.

Vereinigte Edelstahlwerke AG (VEW): *See*—
Kohnhauser, Alexander, 4,477,295, Cl. 148-11.50Q.
Verhecken, Andre: *See*—
Van de Sande, Christian C.; and Verhecken, Andre, 4,477,554, Cl. 430-223.000.
Verzella, David J.: *See*—
Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., 4,477,876, Cl. 364-434.000.
Vetjens, Marinus J. P., to Oce-Nederland B.V. System for converting image information into electrical signals. 4,477,836, Cl. 358-293.000.
Vetter, Heinz: *See*—
Lehmann, Jurgen; Vetter, Heinz; and Arnold, Wolfgang, 4,477,521, Cl. 428-336.000.
Victor Company of Japan, Ltd.: *See*—
Kaneko, Kenji, 4,477,842, Cl. 358-336.000.
Kinjo, Hisao; and Tatsuguchi, Kazuo, 4,477,843, Cl. 358-342.000.
Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki. 4,477,850, Cl. 360-94.000.
Saito, Takashi, 4,476,978, Cl. 206-444.000.
Sugiyama, Hiroyuki, 4,477,839, Cl. 358-326.000.
Victor Equipment Company: *See*—
Pryor, David A., 4,477,262, Cl. 48-180.000.
Viertel, Lothar; and Mahler, Gert, to Gebr. Happich GmbH. Sun visor for automotive vehicles with molding for visor body covering. 4,477,116, Cl. 296-97.00H.
Vifian, Paul R.; and Kint, Gregory C., to Pettibone Corporation. Cone crushers. 4,477,030, Cl. 241-208.000.
Virgilio, Joseph A.; and Heilweil, Emanuel, to Givaudan Corporation. 3-Methyl-1-(2,3,4-and 2,4,4-trimethyl-1-cyclopentylidene) pent-2-en-4-one and isomers, and perfume compositions thereof. 4,477,683, Cl. 568-379.000.
Vitta Corporation: *See*—
Grosner, George J., 4,477,527, Cl. 428-401.000.
Vlattas, Isidoros, to Ciba-Geigy Corporation. Imidazobenzothiadiazepines. 4,477,379, Cl. 260-243.300.
voest-Alpine Aktiengesellschaft: *See*—
Brandl, Harald; Dolc, Reinhard; and Kammerhofer, Klaus, 4,477,722, Cl. 250-222.100.
Vogel, Horst: *See*—
Kroll, Gerald; Vogel, Horst; and Peter, Jurgen, 4,476,664, Cl. 53-258.000.
Vogel, Peter; Braun, Hans-Peter; Berger, Dieter; and Werner, Wolfgang, to Boehringer Mannheim GmbH. Process and composition for separating plasma or serum from whole blood. 4,477,575, Cl. 436-170.000.
Vogue Lighting, Inc.: *See*—
Goralnik, Charles D., 4,477,866, Cl. 362-427.000.
Voigtlaender, Kurt, to Siemens Aktiengesellschaft. Pressurizable container having a safety device for releasing excessive container pressure. 4,476,991, Cl. 220-89.00A.
Volker, Herbert: *See*—
Domesle, Rainer; Volker, Herbert; Koberstein, Edgar; and Pletka, Hans-Dieter, 4,477,417, Cl. 423-213.200.
Volkswagenwerk AG: *See*—
Schnurer, Otmar, 4,477,123, Cl. 303-24.00R.
Vollmar, Kurt, to Pfaff Industriemaschinen GmbH. Reversible feed mechanism for sewing machines. 4,476,795, Cl. 112-316.000.
Vollmar, Kurt, to Pfaff Industriemaschinen GmbH. Upper cloth feed in a sewing machine. 4,476,796, Cl. 112-320.000.
Vourlis, Harry: *See*—
Akridge, James R.; and Vourlis, Harry, 4,477,545, Cl. 429-191.000.
Vries, Lodewijk B.: *See*—
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W. R. Grace & Co., Cryovac Div.: *See*—
Schirmer, Henry G., 4,476,896, Cl. 137-561.00A.
W. Schlafhorst & Co.: *See*—
Rohner, Joachim; and Zumfeld, Heinz, 4,476,671, Cl. 57-261.000.
Wacker-Chemie GmbH: *See*—
Huber, Peter; Wimmer, Franz; Innertsberger, Ernst; and Schmidlkofer, Jakob, 4,477,371, Cl. 252-358.000.
Wacoal Corp.: *See*—
Shibusawa, Masaru, 4,476,895, Cl. 128-546.000.
Wada, Masashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrically erasable programmable read only memory. 4,477,883, Cl. 365-185.000.
Wada, Yasumitsu; and Yamamuro, Isao, to Pioneer Electronic Corporation. Mechanical two-way loudspeaker. 4,477,699, Cl. 179-116.000.
Wade, James J., to Riker Laboratories, Inc. Triazolo [4,3-c]pyrimidines substituted by nitrogen-containing heterocyclic rings. 4,477,450, Cl. 424-246.000.
Wakai, Kiyoshi; Shimodaira, Toshirou; and Fukushima, Yoneharu, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Lamp circuit for automobile. 4,477,747, Cl. 315-200.00A.
Waki, Misao, to Showa Electric Wire & Cable Co., Ltd. Heat-resistant synthetic resin composition. 4,477,624, Cl. 524-736.000.
Walker, John C.; and Thumm, Manfred, to Northern Telecom Limited. Lead frame for leaded semiconductor chip carriers. 4,477,827, Cl. 357-70.000.
Walker, John Q.: *See*—
Banks, Thomas M.; Ruckel, Raymond R.; Spencer, Samuel F.; and Walker, John Q., 4,476,734, Cl. 73-864.160.
Walker, Richard M. Tungsten carbide reactive process. 4,477,009, Cl. 228-119.000.
Wallace, Gary E. Multi-functional garden tool. 4,476,939, Cl. 172-374.000.
Wallace, William K.; and Giardino, David A., to Chicago Pneumatic Tool Company. Socket retainer. 4,477,096, Cl. 279-97.000.
Walling, John B. Flexible tubing production system for well installation. 4,476,923, Cl. 166-65.00R.
Wallsten, Hans I. Thermoforming apparatus. 4,477,243, Cl. 425-292.000.
Walsh, Frank R.: *See*—
Braband, Edward C.; and Walsh, Frank R., 4,477,901, Cl. 371-15.000.
Walter, Chris J.; and Brumm, Gerald A., to Bendix Corporation, The. Address generator for generating addresses to read out data from a memory along angularly disposed parallel lines. 4,477,802, Cl. 340-727.000.
Walton, Frank T., to Wellman Thermal Systems Corporation. Fast start glow plug. 4,477,717, Cl. 219-267.000.
Walz, Alfred. Work-light. 4,477,863, Cl. 362-84.000.
Wang, James C., to General Binding Corporation. Method and apparatus for making improved laminating film and improved film. 4,477,506, Cl. 428-172.000.
Wang, Patrick Y.: *See*—
Schneider, Henry; Maleszka, Ryszard; Wang, Patrick Y.; Veliky, Ivan A.; and Chan, Yui-Kwok, 4,477,569, Cl. 435-161.000.
Wanner, Karl: *See*—
Buck, Manfred; Muller, Frank; and Wanner, Karl, 4,476,941, Cl. 173-117.000.
Warnaka, Glenn E., to Lord Corporation. Structure for absorbing acoustic and other wave energy. 4,477,505, Cl. 428-160.000.
Warner-Lambert Company: *See*—
Bonney, Warren J., 4,477,192, Cl. 366-274.000.
Byrne, David S., 4,476,630, Cl. 30-47.000.
Herrmann, Wolfgang; Geibel, Wolfram; and Satzinger, Gerhard, 4,477,661, Cl. 544-49.000.
Sanchez, Joseph P., 4,477,449, Cl. 424-246.000.
Wason, Thomas D.; and Cain, Charles J., to Cain Encoder Company. Electrode array. 4,477,860, Cl. 361-306.000.
Watanabe, Atsushi: *See*—
Muramatsu, Hiromochi; Watanabe, Atsushi; and Hara, Kunihiko, 4,477,485, Cl. 427-38.000.
Watanabe, David J., to Union Oil Company of California. Inhibition of scale deposition from steam generation fluids. 4,476,930, Cl. 166-279.000.
Watanabe, Masahiro, to Kabushiki Kaisha Komatsu Seisakusho. Speed-responsive retarder control system providing for overheat prevention. 4,477,124, Cl. 303-100.000.
Watanabe, Masaru: *See*—
Sano, Shigeru; Sakurai, Katsumi; Ono, Tatsuo; Tsuruoka, Kanji; and Watanabe, Masaru, 4,477,708, Cl. 219-10.670.
Watanabe, Nobuatsu; Nakajima, Tsuyoshi; and Kawaguchi, Masayuki, to Central Glass Co., Ltd. Ternary intercalation compound of a graphite with a metal fluoride and fluorine, a process for producing the same, and an electrically conductive material comprising the ternary intercalation compound. 4,477,374, Cl. 252-508.000.
Watanabe, Sakuji: *See*—
Terui, Nobuhiko; Watanabe, Sakuji; and Meguro, Hiroshi, 4,477,169, Cl. 354-409.000.
Watanabe, Yoshikazu: *See*—
Menjo, Hiroshi; Watanabe, Yoshikazu; and Sakamoto, Nobuo, 4,477,561, Cl. 430-509.000.
Watari, Ryuzo: *See*—
Gomi, Shimpei; Takeuchi, Tomomitsu; Matsuo, Itaru; Fujii, Masaki; Takatsuka, Toru; and Watari, Ryuzo, 4,477,334, Cl. 208-75.000.
Waterbury, L. David; and Roszkowski, A. Peter, to Syntex (U.S.A.) Inc. Topical treatment of ocular hypertension. 4,477,460, Cl. 424-270.000.
Watkins, Fred E.: *See*—
Winders, Carl E.; and Watkins, Fred E., 4,476,924, Cl. 166-84.000.
Watson, Kenneth, to Westland plc. Helicopter rotor. 4,477,224, Cl. 416-114.000.
Watterson, Walter W. Counting board. 4,477,719, Cl. 235-90.000.
Wawrzyniak, Walter W. Facing head. 4,476,613, Cl. 29-27.00C.
Weber, Carl D.: *See*—
Lattimer, Mary B.; Weber, Carl D.; and Hardt, Zbigniew R., 4,477,619, Cl. 524-171.000.
Weber, Kenneth E.: *See*—
Rogers, Alisa K.; and Weber, Kenneth E., 4,477,329, Cl. 137-93.000.
Webinger, George P., to Champion International Corporation. Lock bottom carton. 4,477,017, Cl. 229-39.00R.
Weiman, Stephan E. Fishing lure. 4,476,646, Cl. 43-34.000.
Weinstock, Joseph; and Wiebelhaus, Virgil D., to SmithKline Beckman Corporation. Kaliuretic compositions containing TMPPT. 4,477,455, Cl. 424-251.000.
Weinstock, Joseph: *See*—
Brennan, Francis T.; Sosnowski, Genevieve F.; and Weinstock, Joseph, 4,477,470, Cl. 424-330.000.
Weisberg, Irving H. Asbestos abatement coating system. 4,477,490, Cl. 427-136.000.
Weiss, Michael A., to Ball Corporation. Microstrip antenna system having nonconductively coupled feedline. 4,477,813, Cl. 343-700.0MS.
Weiss, Stefan, to SKW Trostberg Aktiengesellschaft. Process for the stabilization of aqueous cyanamide solutions. 4,477,421, Cl. 423-275.000.
Weissmuller, Adolf: *See*—
Babler, Fridolin; and Weissmuller, Adolf, 4,477,608, Cl. 523-215.000.

Wella Aktiengesellschaft: *See—*
Galia, Karl, 4,477,001, Cl. 222-402.100.
Wellman Thermal Systems Corporation: *See—*
Walton, Frank T., 4,477,717, Cl. 219-267.000.
Wells, A. Michael: *See—*
Cook, George E.; and Wells, A. Michael, 4,477,713, Cl. 219-124.340.
Welschof, Hans-Heinrich, to Lohr & Brompkamp GmbH. Drive assembly for vehicle wheel. 4,476,950, Cl. 180-73.300.
Welsh, Thomas L.: *See—*
Verboom, Gilles M. L.; Bliznik, Kenneth E.; and Welsh, Thomas L., 4,477,365, Cl. 252-156.000.
Wente, Steven R.: *See—*
Nelson, James W.; and Wente, Steven R., 4,477,213, Cl. 408-241.00R.
Wenzel, Werner, to Nordischer Maschinenbau Rud. Baader GmbH and Co. KG. Method and apparatus for transversely cutting fish. 4,476,610, Cl. 17-55.000.
Werner, Wolfgang: *See—*
Vogel, Peter; Braun, Hans-Peter; Berger, Dieter; and Werner, Wolfgang, 4,477,575, Cl. 436-170.000.
Wernicke, Rolf: *See—*
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Wes Ltd.: *See—*
Tanner, Nicholas J., 4,476,988, Cl. 220-1.500.
Wessel, Wolf: *See—*
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Wessling, Ritchie A.: *See—*
Schmidt, Donald L.; Klingler, Thomas C.; and Wessling, Ritchie A., 4,477,640, Cl. 526-256.000.
West, John D.: *See—*
Moser, Jessie L.; and West, John D., 4,477,132, Cl. 339-14.00P.
Westermann, Karl H., to International Business Machines Corporation. Application tool. 4,477,304, Cl. 156-250.000.
Westfalia Separator AG: *See—*
Meermoller, Theodor; and Greshof, Heinrich, 4,476,808, Cl. 119-14.180.
Westhead, William T., to Scapa Inc. In-line pintle loop seam. 4,476,902, Cl. 139-383.00A.
Westinghouse Brake & Signal Co. Ltd.: *See—*
Oley, Nicholas R., 4,477,826, Cl. 357-68.000.
Westinghouse Electric Corp.: *See—*
Berman, Paul A., 4,476,674, Cl. 60-39.182.
Byrd, Thomas M., Jr.; and Aboujaoude, Khalil F., 4,477,861, Cl. 361-371.000.
Carlson, Gerald L.; and Snider, Warren E., 4,476,712, Cl. 73-61.10C.
Kraus, Mark G., 4,477,870, Cl. 364-186.000.
Kuznetsov, Stephen B., 4,477,760, Cl. 318-773.000.
Putman, Thomas H.; Sweetana, Andrew S., Jr.; and Brown, Frederick J., 4,477,792, Cl. 336-180.000.
Racki, Daniel J., 4,477,911, Cl. 373-36.000.
Thiel, Patrick L.; Lawry, Clifford F.; and DeNeef, John G., 4,477,791, Cl. 336-60.000.
Thomas, Wilbur R.; Hickman, Fred E., III; and Knight, George J., 4,477,512, Cl. 428-236.000.
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Watson, Kenneth, 4,477,224, Cl. 416-114.000.
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Whatley, Roger A.: *See—*
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Wheelabrator-Frye Inc.: *See—*
Ansbaugh, Donald I., 4,476,655, Cl. 51-215.00E.
Wheeler, James R.; Brill, Jack N.; and Miller, Lee E., to Eagle-Picher Industries, Inc. Lattice for a battery electrode substrate. 4,477,546, Cl. 429-211.000.
White, Arthur A. Golf swing training and practice device. 4,477,079, Cl. 273-186.00R.
White, Dwain M.; and Nye, Susan A., to General Electric Company. Process for preparing polyphenylene oxides. 4,477,651, Cl. 528-215.000.
White, Larry W.; and Ingels, Luis, to White, Larry W. Pressure sensing device for holding a toothbrush. 4,476,604, Cl. 15-105.000.
White, Thomas Q., II: *See—*
Clark, David A.; Strong, David C.; and White, Thomas Q., II, 4,477,833, Cl. 358-80.000.
White, Thomas R.: *See—*
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Widener, Donald R.: *See—*
Shuey, John R.; and Widener, Donald R., 4,477,022, Cl. 339-59.00M.
Wiebelhaus, Virgil D.: *See—*
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Wieder, Harold: *See—*
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Hage, Manfred; and Schinkoth, Gerhard, 4,476,704, Cl. 72-276.000.
Wijpkema, Jacob T.: *See—*
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Wiles, James P.: *See—*
Roch, Gerald V.; Wiles, James P.; and Hadley, Chris L., 4,477,754, Cl. 318-568.000.
Wilkes, Alan: *See—*
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Wilkinson, Michael J.: *See—*
Scales, John T.; and Wilkinson, Michael J., 4,476,590, Cl. 3-1.910.
Wilkinson, William H., to Battelle Development Corp. Countercurrent flow absorber and desorber. 4,477,396, Cl. 261-140.00R.
Willcockson, Beth E., executrix: *See—*
Willcockson, George W., deceased; and Law, David C. F., 4,477,438, Cl. 424-130.000.
Willcockson, George W., deceased (by Willcockson, Beth E., executrix); and Law, David C. F., to Surgikos, Inc. Hydrogen peroxide composition. 4,477,438, Cl. 424-130.000.
William R. and Zella B. Stephens Trust: *See—*
Stephens, William R., 4,476,826, Cl. 123-235.000.
Williams, David R., to Coal Industry (Patents) Limited. Drilling equipment with adaptor for steering long boreholes. 4,476,943, Cl. 175-61.000.
Williams, John K. Hydraulic valve timing control device for an internal combustion engine. 4,476,823, Cl. 123-90.120.
Williamson, Calvin C., to Kaiser Steel (Delaware), Inc. Edge preforming of metal plate. 4,476,703, Cl. 72-130.000.
Willis, Kenneth R. Fence. 4,477,059, Cl. 256-65.000.
Willis, Ward L. Drumstick. 4,476,768, Cl. 84-422.00S.
Willms, Lothar; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; Bieringer, Hermann; and **Burstell, Helmut,** to Hoechst Aktiengesellschaft. Heterocyclic phenyl ethers and their herbicidal use. 4,477,276, Cl. 71-94.000.
Wilson, Alan D.: *See—*
Chang, Tai-Hon P.; and Wilson, Alan D., 4,477,729, Cl. 250-492.200.
Wilson, Eddie K., Sr., to Wilson, Eddie K., Sr. Process and apparatus for producing hydraulic cements. 4,477,283, Cl. 106-100.000.
Wilson, Herbert L.: *See—*
Gutierrez, William A.; and Wilson, Herbert L., 4,477,294, Cl. 148-171.000.
Wilson, Robert W., to Powell Manufacturing Company, Inc. Tobacco combine with selective conveyor raising. 4,476,669, Cl. 56-27.500.
Wimmer, Franz: *See—*
Huber, Peter; Wimmer, Franz; Innertsberger, Ernst; and Schmidlkofer, Jakob, 4,477,371, Cl. 252-358.000.
Winders, Carl E.; and **Watkins, Fred E.,** to Camco, Incorporated. Grease injection control head having a specific gas trap. 4,476,924, Cl. 166-84.000.
Windings, Inc.: *See—*
Kotzur, Frank W.; Kotzur, Gregory A.; Meade, John F.; and Hopko, Donald J., 4,477,033, Cl. 242-18.00A.
Windmere Corporation: *See—*
Thaler, Arnold; Friedson, David; and Kin, Lai, 4,477,716, Cl. 219-225.000.
Winter, Joseph; and **Pryor, Michael J.,** to Olin Corporation. Method and apparatus for assembling an optical fiber communication cable. 4,477,147, Cl. 350-96.230.
Winter, Roland A. E.: *See—*
Dexter, Martin; and Winter, Roland A. E., 4,477,614, Cl. 524-91.000.
Wise, James C., to Harris Graphics Corporation. Method and apparatus for assembling sheet material assemblages. 4,477,067, Cl. 270-55.000.
Wittman, Robert H.; Adkins, David E.; and **Chin, Arthur H. T.,** to Hughes Tool Company. Collet actuated ball and socket connector. 4,477,105, Cl. 285-18.000.
Wolcott, Richard A.: *See—*
Lee, John M.; Bauman, William C.; Wolcott, Richard A.; and Burba, John L., III, 4,477,597, Cl. 521-28.000.
Pearce, Roscoe L.; Wolcott, Richard A.; and Pauley, Charles R., 4,477,419, Cl. 423-228.000.
Wolf, Daniel S., to United States of America, Air Force. Mounting construction for turbine vane assembly. 4,477,222, Cl. 415-138.000.
Wolf, Horst, to Zinser Textilmaschinen GmbH. Method of and system for minimizing current consumption of one or more A-C motors driving a variable load. 4,477,761, Cl. 318-800.000.
Wolfson, Lawrence S.: *See—*
Pearl, David R.; and Wolfson, Lawrence S., 4,476,756, Cl. 83-422.000.
Wong, Louis F.; Sterling, Rosstain F.; and **Borcher, Thomas A., Sr.,** to Procter & Gambie Company, The. Free fatty alcohol and buffered alkali earth metal surfactant cakes for optimum performance. 4,477,363, Cl. 252-134.000.
Wong, Wilson T. C., to Sperry Corporation. Floating point processor architecture which performs square root by hardware. 4,477,879, Cl. 364-752.000.
Woodall, Jerry M.: *See—*
Chappell, Terry I.; Pohl, Dieter W.; and Woodall, Jerry M., 4,477,721, Cl. 250-211.00J.
Wright, Allen J., to Hewlett-Packard Company. Electrostatic discharge protected integrated circuit module. 4,477,134, Cl. 339-17.00F.
Wright, Howard J.; Leonard, David P.; and **Etzell, Roger A.,** to Glasurit America, Inc. Process for preparing a multilayer coating. 4,477,536, Cl. 428-522.000.
Wright, Leonard F.: *See—*
Holmes, Paul A.; Collins, Stephen H.; and Wright, Leonard F., 4,477,654, Cl. 528-361.000.

Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., to United Technologies Corporation. Dual response aircraft reference synchronization. 4,477,876, Cl. 364-434.000.

Wrossok, Willi, to SACK GmbH. Method and apparatus for cooling metal strands, more particularly slab and billet strands. 4,476,914, Cl. 164-444.000.

Wu, Lung-ming: *See*—
Johnson, Ronald E.; and Wu, Lung-ming, 4,477,510, Cl. 428-200.000.

Wurziger, Hanns: *See*—
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Xerox Corporation: *See*—
Braband, Edward C.; and Walsh, Frank R., 4,477,901, Cl. 371-15.000.
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Yabuki, Fujio: *See*—
Matsuura, Tamiaki; Aiba, Takeshi; Fukushima, Takashi; Nishimura, Masanori; Ohtsuki, Hiroshi; Yabuki, Fujio; and Kusakabe, Tomio, 4,476,627, Cl. 29-791.000.

Yagi, Isao: *See*—
Isogai, Jun; Nakaya, Seiichi; Saitou, Akira; Takahashi, Akio; and Yagi, Isao, 4,477,284, Cl. 106-104.000.

Yamada, Jun; Senga, Takao; and Suzuki, Shigeyoshi, to Mitsubishi Paper Mills, Ltd. Method for making complex layer type lithografic printing plate. 4,477,547, Cl. 430-14.000.

Yamada, Masanori; and Katsuma, Iwakoto, to Canon Kabushiki Kaisha. Annunciator for flash photographing system. 4,477,170, Cl. 354-415.000.

Yamada, Masanori, to Canon Kabushiki Kaisha. Electronic flash system. 4,477,171, Cl. 354-416.000.

Yamada, Yasuyuki: *See*—
Sato, Yasuhisa; Yokota, Hideo; and Yamada, Yasuyuki, 4,477,155, Cl. 350-469.000.

Yamaguchi, Mikio, to Nippon Seiko K.K. Tilt type steering device. 4,476,741, Cl. 74-493.000.

Yamaguchi, Tadanori: *See*—
Park, Hee K.; and Yamaguchi, Tadanori, 4,477,310, Cl. 156-643.000.

Yamamoto, Kosaku: *See*—
Fukuda, Hirokazu; Shinohara, Koji; Kawabata, Yoshio; Nishijima, Yoshito; and Yamamoto, Kosaku, 4,477,730, Cl. 250-504.00R.

Yamamoto, Masanobu; and Umezu, Nobuhiko, to Sony Corporation. Light modulating apparatus. 4,477,821, Cl. 346-108.000.

Yamamoto, Shigeo: *See*—
Kudo, Kazushige; Yamamoto, Shigeo; and Murase, Shigemitsu, 4,477,497, Cl. 427-386.000.

Yamamoto, Takeshi; and Nakahara, Masao, to Mitutoyo Mfg. Co., Ltd. Cylinder gauge. 4,476,634, Cl. 33-178.00R.

Yamamoto, Takeshi; Goto, Kiyoshi; and Uehara, Masafumi, to Konishiroku Photo Industry Co., Ltd. Photosensitive compositions. 4,477,553, Cl. 430-192.000.

Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, to Nichias Corporation. Gasket and method for high-temperature and high pressure application. 4,477,094, Cl. 277-235.00B.

Yamamoto, Yoshiko: *See*—
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,477,437, Cl. 424-116.000.

Yamamuro, Isao: *See*—
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Yamanashi, Fumiaki; Hayashi, Yuzo; Kano, Mitsuru; Fujiwara, Yoshiyuki; and Tashiro, Yoshizo, to Alps Electric Co., Ltd. Color display liquid crystal composition. 4,477,368, Cl. 252-299.100.

Yamashita, Kiyoshi: *See*—
Koitabashi, Takeo; Yamashita, Kiyoshi; and Iijima, Toshifumi, 4,477,560, Cl. 430-506.000.

Yanagawa, Motoo: *See*—
Asakura, Noboru; Yanagawa, Motoo; and Tsugahara, Takatoshi, 4,477,115, Cl. 296-1.00S.

Yanai, Akio; Shirahata, Ryuji; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Method of making magnetic recording medium. 4,477,489, Cl. 427-132.000.

Yang, Frank J., to Varian Associates, Inc. Septumless jet stream on-column injector for chromatography. 4,476,732, Cl. 73-863.730.

Yang, Frank J.; and Hinshaw, John V., Jr., to Varian Associates, Inc. Solute focusing technique for on-column injection in capillary gas chromatography. 4,477,266, Cl. 55-67.000.

Yao, Shi-Kay: *See*—
Asawa, Charles K.; Austin, Joseph W.; Barnoski, Michael K.; Jackson, Allan R.; Personick, Stewart D.; and Yao, Shi-Kay, 4,477,725, Cl. 250-231.00R.

Yare, Leslie J., to Sendair International Limited. Conveyor system for loading ships. 4,477,210, Cl. 406-166.000.

Yaron, Giora; Shum, Ying K.; Priel, Ury; Prasad, Jayasimha S.; and Ebel, Mark S., to National Semiconductor Corporation. Electrically programmable and erasable memory cell. 4,477,825, Cl. 357-23.500.

Yarris, William T., to Towmotor Corporation. Adjustable chain anchor for lift trucks. 4,476,960, Cl. 187-9.00E.

Yasuda, Takashi: *See*—
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,477,437, Cl. 424-116.000.

Yasufuku, Shouji, to Unionelecs Kabushiki Kaisha. Terrestrial globe including a world clock. 4,477,193, Cl. 368-24.000.

Yasui, Koichi: *See*—
Muroi, Soichi; Seta, Shigetoshi; Matsumoto, Yoshio; Yasui, Koichi; and Imamura, Kazuyoshi, 4,477,636, Cl. 525-444.000.

Yasunaga, Hisao: *See*—
Sato, Kuniaki; Yasunaga, Hisao; Yoshihara, Takahisa; Fujita, Yoshinori; and Kyono, Kazuaki, 4,477,491, Cl. 427-211.000.

Yazaki Corporation: *See*—
Suzuki, Yoshitsugu; Iizuka, Shogo; Kajiyama, Shigeo; Usui, Kenji; Kobayashi, Masahiro; Igura, Toshinori; Kudo, Shigezi; and Suzuki, Sanae, 4,476,629, Cl. 29-863.000.

Yokayama, Kozutoyo. Foldable map with present location indicator and paper reinforcing. 4,477,254, Cl. 434-153.000.

Yokomizo, Yoshikazu: *See*—
Furuichi, Katsushi; Yokomizo, Yoshikazu; Honma, Toshio; and Murakami, Katsumi, 4,477,178, Cl. 355-14.00R.

Yokota, Hideo, to Canon Kabushiki Kaisha. Light measuring device for camera. 4,477,172, Cl. 354-480.000.

Yokota, Hideo: *See*—
Sato, Yasuhisa; Yokota, Hideo; and Yamada, Yasuyuki, 4,477,155, Cl. 350-469.000.

Yokoyama, Shoji: *See*—
Miki, Nobuaki; and Yokoyama, Shoji, 4,476,746, Cl. 74-867.000.

Yoon, Heeyoung, to Conoco Inc. Constant air feed alcohol dissociation process for automobiles. 4,476,818, Cl. 123-3.000.

Yorikane, Toshiaki, to Ryobi Ltd. Click device with a line sagging prevention mechanism for a fishing reel. 4,477,038, Cl. 242-84.21R.

Yoshida, Chosaku: *See*—
Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,664, Cl. 544-360.000.
Hori, Takako; Yoshida, Chosaku; Kiba, Yasuo; Takeno, Ryuko; Nakano, Joji; Nitta, Jun; Kishimoto, Sumiko; Murakami, Shohachi; Tsuda, Hisatsugu; and Saikawa, Isamu, 4,477,666, Cl. 544-385.000.

Yoshida, Hajime, to Hajime Industries Ltd. Rejection system. 4,476,981, Cl. 209-566.000.

Yoshida, Isao: *See*—
Nakano, Hiromitsu; and Yoshida, Isao, 4,477,752, Cl. 318-331.000.

Yoshida, Yukio: *See*—
Akimoto, Ryosaku; Yoshida, Yukio; and Ito, Nobuaki, 4,476,919, Cl. 165-28.000.

Yoshihara, Ryoichi: *See*—
Sakai, Kango; Yoshihara, Ryoichi; Sakurai, Hiroshi; and Minamida, Katsuhiro, 4,477,316, Cl. 204-290.00F.

Yoshihara, Takahisa: *See*—
Sato, Kuniaki; Yasunaga, Hisao; Yoshihara, Takahisa; Fujita, Yoshinori; and Kyono, Kazuaki, 4,477,491, Cl. 427-211.000.

Yoshii, Yuji; and Hiraga, Masaharu, to Sanden Corporation. Scroll type fluid displacement apparatus with offset wraps for reduced housing diameter. 4,477,239, Cl. 418-55.000.

Yoshio, Junichi, to Pioneer Electronic Corporation. Tone arm device. 4,477,893, Cl. 369-244.000.

Yoshioka, Takatoshi: *See*—
Shiga, Masao; Kirihara, Seishin; Kuriyama, Mitsuo; Yoshioka, Takatoshi; and Sasaki, Ryoichi, 4,477,280, Cl. 75-124.000.

Yoshiyuji, Hidetoshi, to Takara Company, New York, Inc. Corner member for furniture assembly. 4,477,201, Cl. 403-231.000.

Young, Alastair J., to Automotive Products plc. Rotary power transmission. 4,476,737, Cl. 74-358.000.

Young, Peter J.: *See*—
Ayers, William M.; Maheshwary, Ashok K.; and Young, Peter J., 4,477,348, Cl. 210-242.300.

Zaccaria, Gary S., to Inventor's Technology Corporation. No lace shoe with adjustable strap fastening mechanism. 4,476,639, Cl. 36-114.000.

Zagni, Angela: *See*—
Garlaschelli, Luigi; Gozzo, Franco; Mendillo, Vincenzo; Garavaglia, Carlo; Mirenna, Luigi; and Zagni, Angela, 4,477,461, Cl. 424-272.000.

Zaidan Hojin Biselbutsu Kagaku Kenkyu Kai (Microbial Chemistry Research Foundation): *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; Iwamoto, Hidenori; and Sakamoto, Shuichi, 4,477,443, Cl. 424-180.000.

Zangerle, Ernst, to Spuhl AG. Apparatus for measuring and regulating the position of a wire end of a spiral spring in a coiling machine. 4,476,702, Cl. 72-15.000.

Zaruba, John V., to Marvin Glass & Associates. Toy doll stroller and ferris wheel. 4,476,649, Cl. 446-114.000.

Zauner, Otto: *See*—
Pauluk, Harry J.; and Zauner, Otto, 4,477,275, Cl. 65-158.000.

Zawadzkas, Gerald A.; and Chou, Mau-Song, to University of Rochester. Method of forming a high temperature, high pressure thin foil seal. 4,477,710, Cl. 219-117.100.

Zeller, Bary L.: *See*—
Eisenhardt, William A., Jr.; Saleeb, Fouad Z.; McKay, Randal P.; and Zeller, Bary L., 4,477,481, Cl. 426-590.000.

Zeller-Pendrey, Jeanine I., to Minnesota Mining and Manufacturing Company. Dry strip antihalation layer for photothermographic film. 4,477,562, Cl. 430-513.000.

Ziman, Yan L.; Kottsov, Vladimir A.; Chesnokov, Jury M.; Dunaev, Boris S.; Drokhanov, Alexei N.; Kraush, Klavdia A.; and Barabanov,

Stanislav D., to Institut Kosmicheskikh Issledovany Akademii Nauk SSSR. Method of obtaining multizone images of objects and multizone system therefor. 4,477,829, Cl. 358-1.000.

Zimmerschied, Alan B., to United States of America, Air Force. Detonation transfer evaluation technique. 4,476,710, Cl. 73-35.000.

Zinser Textilmaschinen GmbH: *See*—
Wolf, Horst, 4,477,761, Cl. 318-800.000.

Zoecon Corporation: *See*—
Kohn, Gustave K.; and Bamberg, Joe T., 4,477,672, Cl. 546-294.000.

Zolotov, Lev A.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Turutin, Veniamin S.; Bezchastnov, Gennady A.; and Telezhnikov, Jury F., 4,477,690, Cl. 174-15.00C.

Zomeworks Corporation: *See*—
Baer, Stephen C., 4,476,854, Cl. 126-425.000.

Zorn, Helmut; Spiess, Karl; and Bina, Wenzel, to INA Walzlager Schaeffler KG. Method of leak proof attachment of a flange-type sheet metal element in the bore of a valve tappet. 4,477,714, Cl. 219-149.000.

Zsembery, Laszlo : *See*—
Matyasi, Jozsef; Kaptay, Gyorgy; Zsembery, Laszlo ; Kokeny, Bela; Toth, Jozsef T.; Toth Nee Homostrei, Maria; and Penzes, Imre, 4,477,427, Cl. 423-628.000.

Zumfeld, Heinz: *See*—
Rohner, Joachim; and Zumfeld, Heinz, 4,476,671, Cl. 57-261.000.

Zwaskis, William J.: *See*—
Failla, Stephen J.; Jewusiak, Stephen J.; and Zwaskis, William J., 4,476,865, Cl. 128-326.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF OCTOBER, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

De Lima Castro Neto, Eduardo. Device for closing bags. Re. 31,706, Cl. 292-307.00R.

Eda, Tadahiro: *See*—
Miyakawa, Seiichi; and Eda, Tadahiro, Re. 31,707, Cl. 355-14.00R.

Gordon, Roy G. Method of depositing electrically conductive, infrared reflective, transparent coatings of stannic oxide. Re. 31,708, Cl. 427-126.200.

Miyakawa, Seiichi; and Eda, Tadahiro, to Ricoh Company, Ltd. Method and apparatus for electrically biasing developing electrode of electrophotographic device. Re. 31,707, Cl. 355-14.00R.

Morihashi, Toshihumi, to Murata Kikai Kabushiki Kaisha. Method and apparatus for producing spun yarn. Re. 31,705, Cl. 57-224.000.

Murata Kikai Kabushiki Kaisha: *See*—
Morihashi, Toshihumi, Re. 31,705, Cl. 57-224.000.

Ricoh Company, Ltd.: *See*—
Miyakawa, Seiichi; and Eda, Tadahiro, Re. 31,707, Cl. 355-14.00R.

LIST OF DESIGN PATENTEES

AB Bahco Verktyg: *See*—
Himbert, Hans; and Palmgren, Bengt, 275,932, Cl. D8-83.000.

Adell, Robert, to U.S. Product Development Company. Door edge guard. 275,945, 10-16-84, Cl. D12-190.000.

AMBA Marketing Systems, Inc.: *See*—
Schimmel, Otto K., 275,910, Cl. D3-48.000.

American Standard Inc.: *See*—
Stairs, Henry M., Jr.; and Neimann, James E., 275,985, Cl. D23-29.000.
Stairs, Henry M., Jr., 275,986, Cl. D23-29.000.

Andrews, Herschel E., Jr. Beverage dispenser. 275,924, 10-16-84, Cl. D7-301.000.

Arad, Avi: *See*—
Kennedy, Melvin; Nagel, Dietmar; and Arad, Avi, 275,978, Cl. D21-134.000.

Atkinson, Emile J. Burning object handling device. 275,929, 10-16-84, Cl. D8-14.000.

Bahier, Marie T. Combined mirror and random selector for a number game. 275,972, 10-16-84, Cl. D21-37.000.

Battle, David, to Visual Information Institute, Inc. Desk tray. 275,968, 10-16-84, Cl. D19-75.000.

Bausch & Lomb Incorporated: *See*—
Markovitz, Aaron M.; and Ramp, Robert H., 275,961, Cl. D16-112.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Electronic calculator. 275,964, 10-16-84, Cl. D18-8.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Cartridge for a non-impact printer. 275,965, 10-16-84, Cl. D18-22.000.

Boldt, Melvin H., deceased; by Boldt, Melvin W., executor; Chuboff, David P.; and Franek, Wayne J., to Zenith Radio Corporation. Television receiver cabinet. 275,952, 10-16-84, Cl. D14-82.000.

Boldt. Melvin H., deceased; by Boldt, Melvin W., executor; Chuboff, David P.; Goldman, Arnold; and Franek, Wayne J., to Zenith Radio Corporation. Television receiver cabinet. 275,953, 10-16-84, Cl. D14-82.000.

Boldt, Melvin W., executor: *See*—
Boldt, Melvin H., deceased; Boldt, Melvin W., executor; Chuboff, David P.; and Franek, Wayne J., 275,952, Cl. D14-82.000.
Boldt, Melvin H., deceased; Boldt, Melvin W., executor; Chuboff, David P.; Goldman, Arnold; and Franek, Wayne J., 275,953, Cl. D14-82.000.

Boone, Bruce T. Cube puzzle. 275,977, 10-16-84, Cl. D21-107.000.

Bowen, Robert F.; and Pollack, Wayne I., to Raytheon Company. Microwave egg cooker base. 275,925, 10-16-84, Cl. D7-357.000.

Bowers, James B., to H and H Promotions, Inc. Illuminable display case. 275,969, 10-16-84, Cl. D6-470.000.

Bowers, James B., to H and H Promotions, Inc. Illuminable display case. 275,970, 10-16-84, Cl. D6-470.000.

Brandel, Jene A. Memorial container. 275,916, 10-16-84, Cl. D6-436.000.

Bridgestone Tire Company Limited: *See*—
Nishio, Hideaki; Kojima, Hiroshi; and Yamauchi, Makoto, 275,941, Cl. D12-147.000.

Burns, Daniel E., to Demco Inc. Portable ice plant. 275,958, 10-16-84, Cl. D15-80.000.

CBS Inc.: *See*—
Smith, Daniel J., 275,963, Cl. D17-20.000.

Chan, Ming K. Combined burner unit and vessel support. 275,927, 10-16-84, Cl. D7-407.000.

Chuboff, David P.: *See*—
Boldt, Melvin H., deceased; Boldt, Melvin W., executor; Chuboff, David P.; and Franek, Wayne J., 275,952, Cl. D14-82.000.
Boldt, Melvin H., deceased; Boldt, Melvin W., executor; Chuboff, David P.; Goldman, Arnold; and Franek, Wayne J., 275,953, Cl. D14-82.000.

Ciganko, David J., to Quaker Oats Company, The. Rocking toy. 275,975, 10-16-84, Cl. D21-66.000.

Clark, Cecily M.: *See*—
Rassias, John N.; and Clark, Cecily M., 275,995, Cl. D25-89.000.
Rassias, John N.; and Clark, Cecily M., 275,996, Cl. D25-89.000.
Rassias, John N.; and Clark, Cecily M., 275,997, Cl. D25-91.000.
Rassias, John N.; and Clark, Cecily M., 275,998, Cl. D25-89.000.

Coats & Clark, Inc.: *See*—
Einhorn, Ruediger, 275,917, Cl. D6-567.000.

Consolidated Foods Corporation: *See*—
Di Tullio, Flavia, 275,906, Cl. D2-24.000.
Locascio, Jack, 275,905, Cl. D2-24.000.
Locascio, Jack, 275,907, Cl. D2-24.000.
Martini, Jeanne M., 275,904, Cl. D2-24.000.
Martini, Jeanne M., 275,908, Cl. D2-24.000.

Corba, Robert E., to S. C. Johnson & Son, Inc. Child-safe actuator for pressurized container. 275,935, 10-16-84, Cl. D9-448.000.

Corona, Oscar M. Combined holder and opener for an expresso coffee-maker or the like. 275,926, 10-16-84, Cl. D7-399.000.

Coyer, William F. Portable smoke detector. 275,936, 10-16-84, Cl. D10-106.000.

Crabtree, Keith D., to Fort Smith Chair Company. Settee frame or the like. 275,919, 10-16-84, Cl. D6-370.000.

Culp, David W., to MSI Data Corporation. Housing for portable data entry terminal. 275,956, 10-16-84, Cl. D14-114.000.

Darda Inc.: *See*—
Kennedy, Melvin; Nagel, Dietmar; and Arad, Avi, 275,978, Cl. D21-134.000.

Demco Inc.: *See*—
Burns, Daniel E., 275,958, Cl. D15-80.000.

Detsch, Steven G. Dental amalgam condensor tip or the like. 275,992, 10-16-84, Cl. D24-10.000.

Di Tullio, Flavia, to Consolidated Foods Corporation. Brassiere. 275,906, 10-16-84, Cl. D2-24.000.

Drummond, Archie G., Jr.: *See*—
Wassergord, Dale R.; Fahnstrom, Dale E.; and Drummond, Archie G., Jr., 275,934, Cl. D9-376.000.

Duclos, Clovis R. Golf putter head. 275,981, 10-16-84, Cl. D21-219.000.

Dunlop Limited: *See*—
Shirashoji, Hisashi, 275,942, Cl. D12-147.000.

Einhorn, Ruediger, to Coats & Clark, Inc. Garment hanger support. 275,917, 10-16-84, Cl. D6-567.000.

Eischen, Clement G., Sr. Exercise device. 275,979, 10-16-84, Cl. D21-191.000.

Ekuan, Kenji, to Yamaha Hatsudoki Kabushiki Kaisha. Electric generator. 275,946, 10-16-84, Cl. D13-1.000.

Etablissements Fernand Berchet: *See*—
Rivollet, Marc, 275,974, Cl. D21-59.000.

Fahnstrom, Dale E.: *See*—
Wassergord, Dale R.; Fahnstrom, Dale E.; and Drummond, Archie G., Jr., 275,934, Cl. D9-376.000.

Fort Smith Chair Company: *See*—
Crabtree, Keith D., 275,919, Cl. D6-370.000.

Franek, Wayne J.: *See*—
Boldt, Melvin H., deceased; Boldt, Melvin W., executor; Chuboff, David P.; and Franek, Wayne J., 275,952, Cl. D14-82.000.
Boldt, Melvin H., deceased; Boldt, Melvin W., executor; Chuboff, David P.; Goldman, Arnold; and Franek, Wayne J., 275,953, Cl. D14-82.000.

G & H Sports Enterprises: *See*—
Harrington, Gary L., 275,994, Cl. D25-16.000.

Gardsby, Christer O. Wall mounted record rack. 275,915, 10-16-84, Cl. D6-569.000.

Gersin, Robert P. Seat module. 275,914, 10-16-84, Cl. D6-357.000.

Gevers, Hubert F. Microfiche. 275,959, 10-16-84, Cl. D16-26.000.

Gibson, J. Scott, to Mitel Corporation. Voice and data telephone set. 275,954, 10-16-84, Cl. D14-101.000.
Goldman, Arnold: *See—*
Boldt, Melvin H., deceased; Boldt, Melvin W., executor; Chuboff, David P.; Goldman, Arnold; and Franek, Wayne J., 275,953, Cl. D14-82.000.
H and H Promotions, Inc.: *See—*
Bowers, James B., 275,969, Cl. D6-470.000.
Bowers, James B., 275,970, Cl. D6-470.000.
Hannecke, Wolf-Dietrich. Display rack module. 275,920, 10-16-84, Cl. D6-510.000.
Harlen, Charles D. Guitar. 275,962, 10-16-84, Cl. D17-18.000.
Harrington, Gary L., to G & H Sports Enterprises. Ice fishing shelter. 275,994, 10-16-84, Cl. D25-16.000.
Harvey, Henry: *See—*
Hydrusko, Lawrence P.; and Harvey, Henry, 275,912, Cl. D6-388.000.
Hasuike, Makio, to Poltrona Frau S.p.A. Luggage case. 275,911, 10-16-84, Cl. D3-76.000.
Heijligers, Antoon. Pusher device for bowling ball. 275,982, 10-16-84, Cl. D21-233.000.
Hickman, Holt; Shields, Neal G.; and Shaw, Mark L., to Specific Cruise Systems, Inc. Automobile turn signal lever with speed control buttons. 275,943, 10-16-84, Cl. D12-174.000.
Himbert, Hans; and Palmgren, Bengt, to AB Bahco Verktyg. Screw driver handle. 275,932, 10-16-84, Cl. D8-83.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Ito, Mamoru, 275,944, Cl. D12-192.000.
Hydrusko, Lawrence P.; and Harvey, Henry. Child's bed. 275,912, 10-16-84, Cl. D6-388.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Bellini, Mario, 275,964, Cl. D18-8.000.
Bellini, Mario, 275,965, Cl. D18-22.000.
Ito, Mamoru, to Honda Giken Kogyo Kabushiki Kaisha. Instrument panel for a motorcycle. 275,944, 10-16-84, Cl. D12-192.000.
Ito, Yoshio: *See—*
Moriai, Yasuharu; Ito, Yoshio; and Sakatani, Atsushi, 275,947, Cl. D13-24.000.
Kennedy, Melvin; Nagel, Dietmar; and Arad, Avi, to Darda Inc. Combined toy motorcycle and rider. 275,978, 10-16-84, Cl. D21-134.000.
Kober, Marvin, to O.K. Machine and Tool Corp. Tool and solder station. 275,931, 10-16-84, Cl. D8-71.000.
Kojima, Hiroshi: *See—*
Nishio, Hideaki; Kojima, Hiroshi; and Yamauchi, Makoto, 275,941, Cl. D12-147.000.
Kroy Inc.: *See—*
Worrell, William R., 275.966, Cl. D19-69.000.
La Telephonie Industrielle et Commerciale Telic Alcatel: *See—*
Moraine, Michel, 275,955, Cl. D14-106.000.
Lederman, Marvin. Scoring machine for playing the card game of gin. 275,937, 10-16-84, Cl. D10-46.100.
Lights of America, Inc.: *See—*
Vakil, Usman U., 275,948, Cl. D13-25.000.
Vakil, Usman U., 275,949, Cl. D13-25.000.
Locascio, Jack, to Consolidated Foods Corporation. Brassiere. 275,905, 10-16-84, Cl. D2-24.000.
Locascio, Jack, to Consolidated Foods Corporation. Brassiere. 275,907, 10-16-84, Cl. D2-24.000.
LoPresti, Daniel R. Levered shovel unit. 275,928, 10-16-84, Cl. D8-10.000.
Marino, Joseph A. Combined holder for drawing toy and doll stand. 275,973, 10-16-84, Cl. D21-59.000.
Markovitz, Aaron M.; and Ramp, Robert H., to Bausch & Lomb Incorporated. Pair of sunglasses. 275,961, 10-16-84, Cl. D16-112.000.
Marshall, Eric J. Telephone. 275,950, 10-16-84, Cl. D14-53.000.
Martini, Jeanne M., to Consolidated Foods Corporation. Brassiere. 275,904, 10-16-84, Cl. D2-24.000.
Martini, Jeanne M., to Consolidated Foods Corporation. Brassiere. 275,908, 10-16-84, Cl. D2-24.000.
Matsuzaka, Yohzoh; and Yasutani, Shigeki, to Tokyo Shibaura Denki Kabushiki Kaisha. Electronic copying machine. 275,960, 10-16-84, Cl. D16-31.000.
Miles Laboratories, Inc.: *See—*
Robinson, Thomas P., 275,991, Cl. D24-8.000.
Mitel Corporation: *See—*
Gibson, J. Scott, 275,954, Cl. D14-101.000.
Moraine, Michel, to La Telephonie Industrielle et Commerciale Telic Alcatel. Data transmission terminal. 275,955, 10-16-84, Cl. D14-106.000.
Morano, George G., Jr. Pen and pencil desk set. 275,967, 10-16-84, Cl. D19-75.000.
Moriai, Yasuharu; Ito, Yoshio; and Sakatani, Atsushi, to Tokai Electric Wire Co., Ltd. Connector housing. 275,947, 10-16-84, Cl. D13-24.000.
Motorola Inc.: *See—*
Taylor, Terrance N., 275,951, Cl. D14-60.000.
MSI Data Corporation: *See—*
Culp, David W., 275,956, Cl. D14-114.000.
Mulligan, Ardythe M. Artist's easel bench. 275,913, 10-16-84, Cl. D6-301.000.
Nagel, Dietmar: *See—*
Kennedy, Melvin; Nagel, Dietmar; and Arad, Avi, 275,978, Cl. D21-134.000.
Neimann, James E.: *See—*
Stairs, Henry M., Jr.; and Neimann, James E., 275,985, Cl. D23-29.000.
Nintendo Co., Ltd.: *See—*
Yokoi, Gunpei, 275,971, Cl. D21-13.000.
Nishio, Hideaki; Kojima, Hiroshi; and Yamauchi, Makoto, to Bridgestone Tire Company Limited. Vehicle tire. 275,941, 10-16-84, Cl. D12-147.000.
O.K. Machine and Tool Corp.: *See—*
Kober, Marvin, 275,931, Cl. D8-71.000.
Ogilvie, Martin B., to Team Lotus International Limited. Model racing car. 275,940, 10-16-84, Cl. D12-88.000.
Oze, Toshihiko. Automatic tee-up apparatus. 275,980, 10-16-84, Cl. D21-208.000.
Palmgren, Bengt: *See—*
Himbert, Hans; and Palmgren, Bengt, 275,932, Cl. D8-83.000.
Pollack, Wayne I.: *See—*
Bowen, Robert F.; and Pollack, Wayne I., 275,925, Cl. D7-357.000.
Poltrona Frau S.p.A.: *See—*
Hasuike, Makio, 275,911, Cl. D3-76.000.
Quaker Oats Company, The: *See—*
Ciganko, David J., 275,975, Cl. D21-66.000.
Quest Medical, Inc.: *See—*
Robinson, Thomas P., 275,989, Cl. D24-8.000.
Robinson, Thomas P., 275,990, Cl. D24-8.000.
Ramp, Robert H.: *See—*
Markovitz, Aaron M.; and Ramp, Robert H., 275,961, Cl. D16-112.000.
Rassias, John N.; and Clark, Cecily M. Building block. 275,995, 10-16-84, Cl. D25-89.000.
Rassias, John N.; and Clark, Cecily M. Building block. 275,996, 10-16-84, Cl. D25-89.000.
Rassias, John N.; and Clark, Cecily M. Building block. 275,997, 10-16-84, Cl. D25-91.000.
Rassias, John N.; and Clark, Cecily M. Building block. 275,998, 10-16-84, Cl. D25-89.000.
Raytheon Company: *See—*
Bowen, Robert F.; and Pollack, Wayne I., 275,925, Cl. D7-357.000.
Realex Corporation: *See—*
Wassergord, Dale R.; Fahnstrom, Dale E.; and Drummond, Archie G., Jr., 275,934, Cl. D9-376.000.
Rivollet, Marc, to Etablissements Fernand Berchet. Bath toy. 275,974, 10-16-84, Cl. D21-59.000.
Robinson, Thomas P., to Quest Medical, Inc. Intravenous metering cassette. 275,989, 10-16-84, Cl. D24-8.000.
Robinson, Thomas P., to Quest Medical, Inc. Intravenous metering cassette. 275,990, 10-16-84, Cl. D24-8.000.
Robinson, Thomas P., to Miles Laboratories, Inc. Intravenous metering cassette. 275,991, 10-16-84, Cl. D24-8.000.
Rubbermaid Incorporated: *See—*
Taylor, William D., 275,918, Cl. D6-510.000.
Ryan, Gregory F.: *See—*
Ryan, Kathryn A.; and Ryan, Gregory F., 275,993, Cl. D24-47.000.
Ryan, Kathryn A.; and Ryan, Gregory F. Universal pacifier case. 275,993, 10-16-84, Cl. D24-47.000.
Ryobi Limited: *See—*
Sakamoto, Masakazu; and Shohoji, Takeshi, 275,983, Cl. D22-25.000.
S. C. Johnson & Son, Inc.: *See—*
Corba, Robert E., 275,935, Cl. D9-448.000.
Sakamoto, Masakazu; and Shohoji, Takeshi, to Ryobi Limited. Fishing reel. 275,983, 10-16-84, Cl. D22-25.000.
Sakatani, Atsushi: *See—*
Moriai, Yasuharu; Ito, Yoshio; and Sakatani, Atsushi, 275,947, Cl. D13-24.000.
Schimmel, Otto K., to AMBA Marketing Systems, Inc. Purse. 275,910, 10-16-84, Cl. D3-48.000.
Schlegel, William B. Coal container. 275,987, 10-16-84, Cl. D23-138.00S.
Shaw Aero Devices, Inc.: *See—*
Shaw, James R., 275,984, Cl. D23-1.000.
Shaw, James R., to Shaw Aero Devices, Inc. Fuel tank cap adaptor ring. 275,984, 10-16-84, Cl. D23-1.000.
Shaw, Mark L.: *See—*
Hickman, Holt; Shields, Neal G.; and Shaw, Mark L., 275,943, Cl. D12-174.000.
Sheppard, Phillip. Painting implement. 275,930, 10-16-84, Cl. D8-16.000.
Shields, Neal G.: *See—*
Hickman, Holt; Shields, Neal G.; and Shaw, Mark L., 275,943, Cl. D12-174.000.
Shirashoji, Hisashi, to Dunlop Limited. Tire for a vehicle wheel. 275,942, 10-16-84, Cl. D12-147.000.
Shohoji, Takeshi: *See—*
Sakamoto, Masakazu; and Shohoji, Takeshi, 275,983, Cl. D22-25.000.
Smith, Daniel J., to CBS Inc. Headstock for guitar. 275,963, 10-16-84, Cl. D17-20.000.
Sonier, Iroy N. Trophy having a vertical time display. 275,938, 10-16-84, Cl. D11-131.000.
Southern Case, Inc.: *See—*
Ward, William W., 275,921, Cl. D6-510.000.
Specific Cruise Systems, Inc.: *See—*
Hickman, Holt; Shields, Neal G.; and Shaw, Mark L., 275,943, Cl. D12-174.000.
Spiegelman, Kathleen Y. Combined totebag and back rest. 275,909, 10-16-84, Cl. D3-43.000.

Stairs, Henry M., Jr.; and Neimann, James E., to American Standard Inc. Handle set for a sanitary fitting or similar article. 275,985, 10-16-84, Cl. D23-29.000.
Stairs, Henry M., Jr., to American Standard Inc. Trip lever for a water closet. 275,986, 10-16-84, Cl. D23-29.000.
Sterrett, Richard L. Combination V-blade plow and fertilizer spreader. 275,957, 10-16-84, Cl. D15-11.000.
Swiss American Importing Co.: *See*—
Weil, Ronald D., 275,922, Cl. D7-1.000.
Taylor, Terrance N., to Motorola Inc. Telephone cradle or similar article. 275,951, 10-16-84, Cl. D14-60.000.
Taylor, William D., to Rubbermaid Incorporated. Bin for storage rack. 275,918, 10-16-84, Cl. D6-510.000.
Team Lotus International Limited: *See*—
Ogilvie, Martin B., 275,940, Cl. D12-88.000.
Tokai Electric Wire Co., Ltd.: *See*—
Moriai, Yasuharu; Ito, Yoshio; and Sakatani, Atsushi, 275,947, Cl. D13-24.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Matsuzaka, Yohzoh; and Yasutani, Shigeki, 275,960, Cl. D16-31.000.
Topor, Alan C.; and Topor, Nora I. Container module. 275,933, 10-16-84, Cl. D9-300.000.
Topor, Nora I.: *See*—
Topor, Alan C.; and Topor, Nora I., 275,933, Cl. D9-300.000.
U.S. Product Development Company: *See*—
Adell, Robert, 275,945, Cl. D12-190.000.
Vakil, Usman U., to Lights of America, Inc. Fluorescent lamp adaptor base. 275,948, 10-16-84, Cl. D13-25.000.
Vakil, Usman U., to Lights of America, Inc. Fluorescent lamp adapter with integral diffuser stud. 275,949, 10-16-84, Cl. D13-25.000.
Visual Information Institute, Inc.: *See*—
Battle, David, 275,968, Cl. D19-75.000.
Walker Manufacturing Company: *See*—
Walker, Robert W., 275,988, Cl. D23-115.000.
Walker, Robert W., to Walker Manufacturing Company. Ceiling air diffuser or the like. 275,988, 10-16-84, Cl. D23-115.000.
Ward, William W., to Southern Case, Inc. Drawer divider. 275,921, 10-16-84, Cl. D6-510.000.
Wassergord, Dale R.; Fahnstrom, Dale E.; and Drummond, Archie G., Jr., to Realex Corporation. Bottle. 275,934, 10-16-84, Cl. D9-376.000.
Weil, Ronald D., to Swiss American Importing Co. Bowl. 275,922, 10-16-84, Cl. D7-1.000.
Wilje, Sven O. Sled. 275,939, 10-16-84, Cl. D12-11.000.
Williams, Teresa E. Aerial toy. 275,976, 10-16-84, Cl. D21-86.000.
Wimmer, Stephen H., to Wimmer's Meat Products, Inc. Meat mold or similar article. 275,923, 10-16-84, Cl. D7-43.000.
Wimmer's Meat Products, Inc.: *See*—
Wimmer, Stephen H., 275,923, Cl. D7-43.000.
Worrell, William R., to Kroy Inc. Tape laminating and dispensing device. 275,966, 10-16-84, Cl. D19-69.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Ekuan, Kenji, 275,946, Cl. D13-1.000.
Yamauchi, Makoto: *See*—
Nishio, Hideaki; Kojima, Hiroshi; and Yamauchi, Makoto, 275,941, Cl. D12-147.000.
Yasutani, Shigeki: *See*—
Matsuzaka, Yohzoh; and Yasutani, Shigeki, 275,960, Cl. D16-31.000.
Yokoi, Gunpei, to Nintendo Co., Ltd. Hand-held type electronic game housing. 275,971, 10-16-84, Cl. D21-13.000.
Zenith Radio Corporation: *See*—
Boldt, Melvin H., deceased; Boldt, Melvin W., executor; Chuboff, David P.; and Franek, Wayne J., 275,952, Cl. D14-82.000.
Boldt, Melvin H., deceased; Boldt, Melvin W., executor; Chuboff, David P.; Goldman, Arnold; and Franek, Wayne J., 275,953, Cl. D14-82.000.

LIST OF PLANT PATENTEES

Armstrong Nurseries, Inc.: *See*—
Swim, Herbert C.; and Christensen, Jack E., 5,295, Cl. 11.000.
Carrier, Leonard E. Carnation Plant. 5,293, 10-16-84, Cl. 71.000.
Carrier, Leonard E. Carnation plant. 5,294, 10-16-84, Cl. 70.000.
Christensen, Jack E.: *See*—
Swim, Herbert C.; and Christensen, Jack E., 5,295, Cl. 11.000.
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CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

94 4,476,587
169 4,476,588
184.5 4,476,589

CLASS 3

1.91 4,476,590
13 4,476,591

CLASS 5

164 B 4,476,592
417 4,476,593
464 4,476,594
478 4,476,595

CLASS 7

138 4,476,596
159 4,476,597
170 4,476,598

CLASS 10

139 WH 4,476,599

CLASS 12

142 V 4,476,600

CLASS 15

21 D 4,476,601
28 4,476,602
104.3 SN 4,476,603
105 4,476,604
179 4,476,605
268 4,476,606
339 4,476,607
353 4,476,608

CLASS 17

1 R 4,476,609
55 4,476,610

CLASS 19

105 4,476,611

CLASS 24

304 4,476,612

CLASS 29

27 C 4,476,613
148.4 A 4,476,614
243.54 4,476,615
243.56 4,476,616
264 4,476,617
272 4,476,618
429 4,476,619
569 L 4,476,620
571 4,476,621
4,476,622
576 W 4,476,623
623.1 4,476,624
734 4,476,625
740 4,476,626
791 4,476,627
861 4,476,628
863 4,476,629

CLASS 30

47 4,476,630
92 4,476,631
276 4,476,632
363 4,476,633

CLASS 33

178 R 4,476,634
228 4,476,635

CLASS 34

114 4,476,636
119 4,476,637

CLASS 36

86 4,476,638
114 4,476,639
121 4,476,640

CLASS 37

118 R 4,476,641
142 R 4,476,642
245 4,476,643

CLASS 42

1 A 4,476,644

CLASS 43

15 4,476,645
34 4,476,646
122 4,476,647

CLASS 44

30 4,477,257
51 4,477,258
4,477,259
4,477,260
63 4,477,261

CLASS 47

85 4,476,651

CLASS 48

180 4,477,262

CLASS 49

235 4,476,652
468 4,476,653

CLASS 51

26 4,476,654
215 E 4,476,655
325 4,476,656

CLASS 52

139 4,476,657
395 4,476,658
404 4,476,659
515 4,476,660
546 4,476,661
693 4,476,662
730 4,476,663

CLASS 53

258 4,476,664
575 4,476,665

CLASS 55

6 4,477,263
25 4,477,264
26 4,477,265
67 4,477,266
68 4,477,267
155 4,477,268
290 4,477,269
316 4,477,270
416 4,477,271
471 4,477,272

CLASS 56

13.6 4,476,666
27.5 4,476,669
119 4,476,667
202 4,476,668
328 R 4,476,670

CLASS 57

224 Re.31,705
261 4,476,671
333 4,476,672

CLASS 59

86 4,476,673

CLASS 60

39.182 4,476,674
39.281 4,476,675
290 4,476,676
328 4,476,677
404 4,476,678
434 4,476,679
444 4,476,680
486 4,476,681
602 4,476,682
648 4,476,683
689 4,476,684

CLASS 62

3 4,476,685
63 4,476,686
64 4,476,687
149 4,476,688
198 4,476,690
217 4,476,691
228.5 4,476,692
402 4,476,693
476 4,476,694
512 4,476,695

CLASS 65

3.12 4,477,273
13 4,477,274
158 4,477,275

CLASS 66

75.2 4,476,696
193 4,476,697

CLASS 70

25 4,476,698
34 4,476,699
99 4,476,700
276 4,476,701

CLASS 71

94 4,477,276

CLASS 72

15 4,476,702
130 4,476,703
276 4,476,704
478 4,476,705

CLASS 73

1 G 4,476,706
4 R 4,476,707
4,476,708
23 4,476,709
35 4,476,710
4,476,711
61.1 C 4,476,712
4,476,713
118 4,476,714
151 4,476,715
154 4,476,716
159 4,476,717
171 4,476,718
200 4,476,719
202 4,476,720
431 4,476,721
434 4,476,722
453 4,476,723
585 4,476,724
704 4,476,725
708 4,476,726
847 4,476,727
861.22 4,476,728
861.61 4,476,729
4,476,730
863.73 4,476,731
4,476,732
863.91 4,476,733
864.16 4,476,734

CLASS 74

84 R 4,476,735
341 4,476,736
358 4,476,737
475 4,476,738
4,476,739
476 4,476,740
493 4,476,741
551.9 4,476,742
665 GB 4,476,743
751 4,476,744
866 4,476,745
867 4,476,746
4,476,748
869 4,476,747

CLASS 75

0.5 B 4,477,277
51 4,477,278
60 4,477,279
124 4,477,280

CLASS 81

53.2 4,476,749
300 4,476,750
440 4,476,751

CLASS 82

28 R 4,476,752

CLASS 83

36 4,476,753
150 4,476,754
364 4,476,755
422 4,476,756
446 4,476,757
479 4,476,758
574 4,476,759
582 4,476,760
614 4,476,761
640 4,476,762

CLASS 84

1.03 4,476,763
4,476,764
4,476,765
4,476,766
115 4,476,767
422 S 4,476,768
434 4,476,769
458 4,476,770

CLASS 92

78 4,476,771
168 4,476,772

CLASS 98

2.08 4,476,773
2.13 4,476,774

CLASS 99

295 4,476,775
302 C 4,476,776
421 H 4,476,777
516 4,476,778

CLASS .10

229 4,476,789

CLASS 100

7 4,476,779
214 4,476,780

CLASS 101

3 R 4,476,781
415.1 4,476,783
450.1 4,476,782

CLASS 102

428 4,476,784
522 4,476,785

CLASS 104

12 4,476,786
96 4,476,787

CLASS 105

451 4,476,788

CLASS 106

14.34 4,477,281
34 4,477,282
100 4,477,283
104 4,477,284

CLASS 110

245 4,476,790
346 4,476,791

CLASS 112

142 4,476,792
221 4,476,793
226 4,476,794
316 4,476,795
320 4,476,796

CLASS 114

65 R 4,476,797
77 R 4,476,798
103 4,476,799
172 4,476,800
230 4,476,801
296 4,476,802

CLASS 116

34 R 4,476,803

CLASS 118

19 4,476,804
65 4,476,805
110 4,476,806
317 4,476,807

CLASS 119

14.18 4,476,808
16 4,476,809
29 4,476,810
52 AF 4,476,811
75 4,476,812
4,476,813
106 4,476,814
147 R 4,476,815

CLASS 122

4 D 4,476,816

CLASS 123

3 4,476,817
4,476,818
25 C 4,476,819
41.05 4,476,820
68 4,476,821
90.12 4,476,823
90.39 4,476,824
90.41 4,476,822
198 DB 4,476,825
235 4,476,826
276 4,476,827
339 4,476,828
357 4,476,829
436 4,476,833
440 4,476,834
467 4,476,835
479 4,476,830
480 4,476,831
502 4,476,832
4,476,836
4,476,837
556 4,476,838
557 4,476,839
4,476,840
4,476,841
563 4,476,842
585 4,476,843
637 4,476,844

CLASS 124

35 A 4,476,845
41 A 4,476,846

CLASS 125

11 DF 4,476,847

CLASS 126

19 M 4,476,848
25 R 4,476,849
112 4,476,850
247 4,476,851
289 4,476,852
425 4,476,853
4,476,854
426 4,476,855
447 4,476,856

CLASS 128

77 4,476,857
80 R 4,476,858
87 B 4,476,859
132 D 4,476,860
303 R 4,476,861
303.17 4,476,862
305 4,476,863
305.1 4,476,864
326 4,476,865
344 4,476,866
400 4,476,867
419 PG 4,476,868
419 PT 4,476,869
546 4,476,895
634 4,476,870
642 4,476,871
4,476,872
660 4,476,873
663 4,476,874
666 4,476,875
682 4,476,876
736 4,476,877
745 4,476,878
760 4,476,879
778 4,476,880

CLASS 131

308 4,476,881
336 4,476,882

CLASS 132

73 4,476,883

CLASS 133

4 A 4,476,884

CLASS 134

3 4,477,285
10 4,477,286
15 4,477,287
19 4,477,288
34 4,477,289

CLASS 135

69 4,476,885

CLASS 136

203 4,477,686
229 4,477,687
258 4,477,688

CLASS 137

15 4,476,886
56 4,476,887
93 4,477,329
102 4,476,888
116.3 4,476,889
269 4,476,890
270 4,476,891
322 4,476,892
486 4,476,893
552.7 4,476,894
561 A 4,476,896
594 4,476,897
624.14 4,476,898

CLASS 139

1 E 4,476,899
91 4,476,900
370.2 4,476,901
383 A 4,476,902
435 4,476,903
452 4,476,904

CLASS 140

105 4,476,905

CLASS 144

116 4,476,906

CLASS 148

6 4,477,290
6.14 R 4,477,296
11.5 Q 4,477,291
4,477,295
20 4,477,292
31.5 4,477,293
171 4,477,294

CLASS 149

109.6 4,477,297

CLASS 152

179 4,476,907
357 A 4,476,908

CLASS 156

44 4,477,300
54 4,477,298
72 4,477,299
136 4,477,301
165 4,477,302
230 4,477,303
250 4,477,304
384 4,477,305
578 4,477,306
580 4,477,307
603 4,477,308
635 4,477,309
643 4,477,310
4,477,311
656 4,477,312

CLASS 160

178 C 4,476,909
291 4,476,910

CLASS 162

123 4,477,313

CLASS 164

65 4,476,911
316 4,476,912
346 4,476,913
444 4,476,914
484 4,476,915
519 4,476,916

CLASS 165

1 4,476,917
4,476,918
28 4,476,919
29 4,476,920
48 R 4,476,921
104.25 4,476,922

CLASS 166

65 R 4,476,923
84 4,476,924
105.1 4,476,925
248 4,476,926
261 4,476,927
267 4,476,928

273 4,476,929
279 4,476,930
294 4,476,931
303 4,476,932
324 4,476,933
368 4,476,934
373 4,476,935
383 4,476,936

CLASS 169

26 4,476,937

CLASS 172

22 4,476,938
374 4,476,939

CLASS 173

37 4,476,940
117 4,476,941
169 4,476,942

CLASS 174

15 C 4,477,690
15 CA 4,477,689
22 C 4,477,691
31 R 4,477,692
36 4,477,693
48 4,477,694

CLASS 175

61 4,476,943
65 4,476,944
203 4,476,945

CLASS 177

144 4,476,946

CLASS 178

3 4,477,695

CLASS 179

18 BC 4,477,696
84 T 4,477,697
90 BD 4,477,698
116 4,477,699

CLASS 180

2.1 4,476,947
7.2 4,476,948
65.1 4,476,949
73.3 4,476,950
219 4,476,951
247 4,476,952
249 4,476,953
333 4,476,954

CLASS 182

2 4,476,955
5 4,476,956
21 4,476,957
82 4,476,958

CLASS 187

9 E 4,476,960
9 R 4,476,959

CLASS 188

32 4,476,961
71.1 4,476,962
79.5 B 4,476,963
109 4,476,964
171 4,476,965
280 4,476,966
319 4,476,967
329 4,476,968
380 4,476,969

CLASS 192

0.052 4,476,970

CLASS 198

323 4,476,971
415 4,476,972
744 4,476,973
832 4,476,974
864 4,476,975

CLASS 200

5 A 4,477,700
50 AA 4,477,701
61.62 4,477,702
76 4,477,703
144 R 4,477,704

CLASS 264

1 T 4,477,314
1.5 4,477,315
33 4,477,317
51 4,477,318
56 R 4,477,319
96 4,477,320
98 4,477,321
103 4,477,322
119 4,477,323
129.1 4,477,324
159.12 4,477,325
159.13 4,477,326
159.15 4,477,327
159.23 4,477,328
290 F 4,477,316
414 4,477,330

CLASS 206

219 4,476,976
434 4,476,977
444 4,476,978
554 4,476,979

CLASS 208

8 R 4,477,331
4,477,332
30 4,477,333
75 4,477,334
113 4,477,335
120 4,477,336
188 4,477,337

CLASS 209

5 4,477,338
22 4,477,339
166 4,477,340
170 4,477,341
459 4,476,980
566 4,476,981
582 4,476,982

CLASS 210

87 4,477,342
108 4,477,343
109 4,477,344
130 4,477,345
198.2 4,477,346
232 4,477,347
242.3 4,477,348
297 4,477,349
387 4,477,350
396 4,477,351
448 4,477,352
633 4,477,353
634 4,477,354
665 4,477,355
741 4,477,356
748 4,477,357
783 4,477,358
785 4,477,359

CLASS 211

57.1 4,476,983
86 4,476,984
126 4,476,985
134 4,476,986

CLASS 215

319 4,476,987

CLASS 219

0.55 B 4,477,706
10.55 A 4,477,707
10.55 E 4,477,705
10.67 4,477,708
109 4,477,709
117.1 4,477,710
121 PJ 4,477,711
124.34 4,477,712
4,477,713
149 4,477,714
205 4,477,715
225 4,477,716
267 4,477,717
388 4,477,718

CLASS 220

1.5 4,476,988
4 E 4,476,989
83 4,476,990
89 A 4,476,991
219 4,476,992
276 4,476,993
318 4,476,994
371 4,476,995

CLASS 221

61 4,476,996
171 4,476,997

CLASS 222

61 4,476,998
75 4,476,999
135 4,477,000
402.1 4,477,001
521 4,477,002
642 4,477,003

CLASS 224

39 4,477,004
218 4,477,005

CLASS 226

18 4,477,006

CLASS 227

19 4,477,007
4,477,008

CLASS 228

119 4,477,009
138 4,477,010
173 A 4,477,011
181 4,477,012

CLASS 229

1.5 R 4,477,013
22 4,477,014
23 R 4,477,015
28 R 4,477,016
39 R 4,477,017

CLASS 235

90 4,477,719

CLASS 236

1 B 4,477,018
10 4,477,019
49 4,477,020

CLASS 237

67 4,477,021

CLASS 239

265.11 4,477,024
265.35 4,477,025
340 4,477,023
428.5 4,477,026
585 4,477,027

CLASS 241

69 4,477,028
101.7 4,477,029
206 4,477,030
211 4,477,031

CLASS 242

18 A 4,477,033
18 PW 4,477,032
4,477,034
67.1 R 4,477,035
67.2 4,477,036
75.4 4,477,037
84.21 R 4,477,038

CLASS 244

53 B 4,477,039
58 4,477,040
122 AG 4,477,041
199 4,477,042
223 4,477,043
4,477,044

CLASS 248

1 4,477,045
95 4,477,046
201 4,477,047
447.1 4,477,048
524 4,477,049
636 4,477,050

CLASS 250

201 4,477,720
211 J 4,477,721
222.1 4,477,722
227 4,477,723
4,477,724
231 R 4,477,725
237 G 4,477,726
4,477,727
385 4,477,728
492.2 4,477,729
504 R 4,477,730
506.1 4,477,731

CLASS 251

30 4,477,051
57 4,477,052
86 4,477,053
122 4,477,054
174 4,477,055
282 4,477,056
306 4,477,057

CLASS 252

8.55 R 4,477,360
51.5 R 4,477,362
106 4,477,361
134 4,477,363
142 4,477,364
156 4,477,365
182 4,477,366
184 4,477,367
299.1 4,477,368
299.6 4,477,369
321 4,477,370
358 4,477,371
508 4,477,374
542 4,477,375
545 4,477,372
572 4,477,376
626 4,477,373
631 4,477,377

CLASS 256

19 4,477,058
65 4,477,059

CLASS 260

239 BB 4,477,378
243.3 4,477,379
385 4,477,380
392 4,477,381
398 4,477,382
410.6 4,477,383
410.9 R 4,477,384
4,477,385
412.2 4,477,386
429 R 4,477,387
429.7 4,477,388
453 PH 4,477,389
502.5 E 4,477,390
502.5 G 4,477,391

CLASS 261

39 A 4,477,392
76 4,477,393
112 4,477,394
131 4,477,395
140 R 4,477,396

CLASS 264

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40.1 4,477,398
45.2 4,477,399
45.7 4,477,400
61 4,477,401
65 4,477,402
104 4,477,403
220 4,477,404
250 4,477,405
275 4,477,406
288.4 4,477,407
532 4,477,408

CLASS 266

48 4,477,060

CLASS 267

8 R 4,477,061
64.28 4,477,062

CLASS 269

93 4,477,063
231 4,477,064

CLASS 270

31 4,477,065
52 4,477,066
55 4,477,067

CLASS 271

186 4,477,068

CLASS 272

3 4,477,069
70 4,477,070
72 4,477,071
73 4,477,072
93 4,477,073
123 4,477,074

CLASS 273

26 C 4,477,075
55 B 4,477,077
55 R 4,477,076
122 A 4,477,078
186 R 4,477,079
241 4,477,080
251 4,477,081
403 4,477,082
411 4,477,083
423 4,477,084

CLASS 277

22 4,477,085
26 4,477,086
4,477,087
83 4,477,088
153 4,477,089
174 4,477,090
211 4,477,091
4,477,092
4,477,093
235 B 4,477,094

CLASS 279

1 A 4,477,095
97 4,477,096

CLASS 280

203 4,477,097
242 WC 4,477,098
421 4,477,099
434 4,477,100
461 A 4,477,101
615 4,477,102

CLASS 283

62 4,477,103

CLASS 285

18 4,477,104
4,477,105
47 4,477,106
134 4,477,107
149 4,477,108
361 4,477,109

CLASS 292

1 4,477,110
307 R Re.31,706

CLASS 294

1 BA 4,477,111
16 4,477,112
4,477,113
50.6 4,477,114

CLASS 296

1 S 4,477,115
97 H 4,477,116

CLASS 297

45 4,477,117
85 4,477,118

CLASS 299

34 4,477,119

CLASS 301

6 W 4,477,120
112 4,477,121

CLASS 303

6 C 4,477,122
24 R 4,477,123
100 4,477,124
116 4,477,125

CLASS 307

9 4,477,732
35 4,477,733
120 4,477,734
270 4,477,735
297 4,477,736
4,477,737
445 4,477,738
449 4,477,739
455 4,477,740
473 4,477,741
571 4,477,742

CLASS 308

1 A 4,477,126

CLASS 310

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156 4,477,744
4,477,745

CLASS 312

8 4,477,127
111 4,477,128
116 4,477,129
219 4,477,130

CLASS 315

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200 A 4,477,747
306 4,477,748
397 4,477,749

CLASS 318

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280 4,477,751
331 4,477,752
563 4,477,753
568 4,477,754
611 4,477,755
696 4,477,756
4,477,757
4,477,758
4,477,759
773 4,477,760
800 4,477,761
802 4,477,762
811 4,477,763

CLASS 320

62 4,477,764

CLASS 322

20 4,477,765
28 4,477,766
59 4,477,767

CLASS 324

51 4,477,768
54 4,477,769
57 N 4,477,770
58.5 C 4,477,771
59 4,477,772
79 R 4,477,773
158 P 4,477,774
158 R 4,477,775
227 4,477,776
300 4,477,777
466 4,477,778

CLASS 328

151 4,477,779

CLASS 330

265 4,477,780
286 4,477,781
288 4,477,782

CLASS 333

138 4,477,783
153 4,477,784
202 4,477,785
207 4,477,786
208 4,477,787
235 4,477,788

CLASS 335

257 4,477,789

CLASS 336

60 4,477,790
4,477,791
180 4,477,792

CLASS 338

21 4,477,793
32 R 4,477,794
163 4,477,795

CLASS 339

14 P 4,477,132
14 R 4,477,131
4,477,135
17 F 4,477,134
17 M 4,477,133
49 R 4,477,136
59 M 4,477,022
4,477,137
65 4,477,138
88 R 4,477,139
89 M 4,477,140
122 R 4,477,141
125 R 4,477,142
126 RS 4,477,143
177 R 4,477,144

CLASS 340

105 4,477,796
365 S 4,477,797
527 4,477,798
533 4,477,799
4,477,800
684 4,477,801
722 4,477,803
727 4,477,802
747 4,477,804
784 4,477,805
825.32 4,477,806
825.44 4,477,807
4,477,808
825.54 4,477,809
870.37 4,477,810

CLASS 343

17.7 4,477,811
417 4,477,812
700 MS 4,477,813
725 4,477,814
756 4,477,815
786 4,477,816
861 4,477,817
881 4,477,818

CLASS 346

76 L 4,477,819
76 PH 4,477,820
108 4,477,821
136 4,477,822
140 R 4,477,823
4,477,869
205 4,477,593

CLASS 350

96.10 4,477,145
96.21 4,477,146
96.23 4,477,147
286 4,477,148
288 4,477,149
289 4,477,150
351 4,477,151
394 4,477,152
426 4,477,153
432 4,477,154
469 4,477,155
503 4,477,156
532 4,477,157

CLASS 351

169 4,477,158
221 4,477,159

CLASS 352

40 4,477,160

CLASS 354

173.11 4,477,162
4,477,163
286 4,477,164
299 4,477,165
300 4,477,166
400 4,477,167
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409 4,477,169
415 4,477,170
416 4,477,171

448 4,477,161
480 4,477,172

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3 DD 4,477,173
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3 R 4,477,175
3 SH 4,477,181
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152 4,477,185
246 4,477,186
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350 4,477,188
374 4,477,189
418 4,477,190

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17 4,477,824
23.5 4,477,825
68 4,477,826
70 4,477,827
80 4,477,828

CLASS 358

1 4,477,829
4,477,830
27 4,477,831
44 4,477,832
80 4,477,833
113 4,477,834
213 4,477,835
293 4,477,836
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322 4,477,838
326 4,477,839
330 4,477,840
335 4,477,841
336 4,477,842
342 4,477,843

CLASS 360

8 4,477,844
26 4,477,845
46 4,477,846
60 4,477,847
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77 4,477,849
94 4,477,850
95 4,477,851
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393 4,477,862

CLASS 362

84 4,477,863
311 4,477,864
396 4,477,865
427 4,477,866

CLASS 363

26 4,477,867
28 4,477,868

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200 4,477,871
4,477,872
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900 4,477,880
4,477,881
4,477,882

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189 4,477,884
204 4,477,885
222 4,477,886

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274 4,477,192

CLASS 367

20 4,477,887
152 4,477,888

CLASS 368

24 4,477,193
69 4,477,194
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157 4,477,196

CLASS 369

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53 4,477,890
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132 4,477,892
244 4,477,893
270 4,477,894

CLASS 370

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24 4,477,896
62 4,477,897
80 4,477,898
94 4,477,899
112 4,477,900

CLASS 371

15 4,477,901
25 4,477,902
37 4,477,903
49 4,477,904

CLASS 372

25 4,477,905
41 4,477,906
64 4,477,907
88 4,477,908
95 4,477,909

CLASS 373

9 4,477,910
36 4,477,911

CLASS 375

1 4,477,912
13 4,477,913
14 4,477,914
30 4,477,915
60 4,477,916

CLASS 376

296 4,477,409
404 4,477,410
412 4,477,411

CLASS 377

11 4,477,917
37 4,477,918
47 4,477,919
52 4,477,920

CLASS 378

20 4,477,922
34 4,477,921
95 4,477,923

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15 4,477,924
43 4,477,925

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CLASS 384

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231 4,477,201
316 4,477,202

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111 4,477,203

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169 4,477,205
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195 4,477,207
261 4,477,208
4,477,209

CLASS 406

166 4,477,210

CLASS 407

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104 4,477,212

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CLASS 409

34 4,477,214
245 4,477,215
257 4,477,216

CLASS 411

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CLASS 414

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139 4,477,220
735 4,477,221

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138 4,477,222
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134 A 4,477,225
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198 A 4,477,227
241 A 4,477,228

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366 4,477,233
393 4,477,234
414 4,477,235
454 4,477,236
539 4,477,237

CLASS 418

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55 4,477,239
94 4,477,240

CLASS 422

40 4,477,412
62 4,477,413
125 4,477,414
164 4,477,415

CLASS 423

67 4,477,416
213.2 4,477,417
219 4,477,418
228 4,477,419
234 4,477,420
275 4,477,421
327 4,477,422
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387 4,477,424
485 4,477,425
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628 4,477,427

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93 4,477,433
94 4,477,434
95 4,477,435
4,477,436
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130 4,477,438
162 4,477,439
177 4,477,440
4,477,441
180 4,477,442
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4,477,444
239 4,477,445
244 4,477,446
246 4,477,447
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4,477,449
4,477,450
248.54 4,477,451
250 4,477,452
4,477,453
4,477,454
251 4,477,455
258 4,477,456
260 4,477,457
266 4,477,458
269 4,477,459
270 4,477,460
272 4,477,461
273 P 4,477,462
274 4,477,463
275 4,477,464
4,477,465
4,477,466
317 4,477,467
4,477,468
322 4,477,469
330 4,477,470

CLASS 425

85 4,477,241
207 4,477,242
292 4,477,243

CLASS 426

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98 4,477,472
231 4,477,473
250 4,477,474
4,477,475
262 4,477,476
330.4 4,477,477
330.6 4,477,478
549 4,477,479
578 4,477,480
590 4,477,481
632 4,477,482

CLASS 427

8 4,477,483
10 4,477,484
38 4,477,485
54.1 4,477,486
123 4,477,487
126.2 Re.31,708
129 4,477,488
132 4,477,489
136 4,477,490
211 4,477,491
215 4,477,492
228 4,477,493
255.3 4,477,494
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375 4,477,496
386 4,477,497
389.9 4,477,498
412.1 4,477,499

CLASS 428

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35 4,477,501
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102 4,477,503
138 4,477,504
160 4,477,505
172 4,477,506
188 4,477,507
192 4,477,508
198 4,477,509
200 4,477,510
201 4,477,511
236 4,477,512
246 4,477,513
264 4,477,514
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296 4,477,516
324 4,477,517
327 4,477,518
331 4,477,519
336 4,477,520
4,477,521
359 4,477,522
389 4,477,523
391 4,477,524
395 4,477,525
399 4,477,526
401 4,477,527
412 4,477,528
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413 4,477,530
425.9 4,477,531
441 4,477,532
458 4,477,533
461 4,477,534
476.3 4,477,535
522 4,477,536
577 4,477,537
656 4,477,538

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27 4,477,540
33 4,477,541
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115 4,477,543
160 4,477,544
191 4,477,545
211 4,477,546

CLASS 430

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4,477,548
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59 4,477,550
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192 4,477,553
223 4,477,554
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308 4,477,557
384 4,477,558
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506 4,477,560
509 4,477,561
513 4,477,562
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567 4,477,564
4,477,565

CLASS 431

78 4,477,245
114 4,477,246
146 4,477,247
153 4,477,248
253 4,477,249

CLASS 432

3 4,477,250
11 4,477,244
106 4,477,251

CLASS 433

29 4,477,252
126 4,477,253

CLASS 434

153 4,477,254

CLASS 435

16 4,477,566
71 4,477,567
97 4,477,568
161 4,477,569
253 4,477,570
4,477,571

CLASS 436

6 4,477,572
33 4,477,573
70 4,477,574
170 4,477,575
500 4,477,576
510 4,477,577
518 4,477,578

CLASS 446

114 4,476,649
166 4,476,648
362 4,476,650

CLASS 501

1 4,477,579
12 4,477,580
137 4,477,581

CLASS 502

26 4,477,582
71 4,477,583
77 4,477,584
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104 4,477,586
111 4,477,587
119 4,477,588
169 4,477,589
334 4,477,590
340 4,477,591
342 4,477,592

CLASS 518

700 4,477,594
715 4,477,595

CLASS 521

25 4,477,596
28 4,477,597
62 4,477,598
89 4,477,599
108 4,477,600
111 4,477,601
157 4,477,602
4,477,603

CLASS 523

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155 4,477,605
200 4,477,606
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CLASS 524

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76 4,477,612
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136 4,477,617
157 4,477,618
171 4,477,619
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522 4,477,622
710 4,477,623
736 4,477,624
789 4,477,625
862 4,477,626

CLASS 525

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147 4,477,632
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437 4,477,635
444 4,477,636
469 4,477,637

CLASS 526

84 4,477,638
124 4,477,639
256 4,477,640

CLASS 528

15 4,477,641
61 4,477,642
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73 4,477,644
99 4,477,645
118 4,477,646
176 4,477,647
185 4,477,648
212 4,477,649
215 4,477,650
4,477,651
232 4,477,652
289 4,477,653
361 4,477,654
4,477,655
487 4,477,656

CLASS 536

91 4,477,657

CLASS 544

16 4,477,658
21 4,477,659
28 4,477,660
49 4,477,661
212 4,477,662
310 4,477,663
360 4,477,664
384 4,477,665
385 4,477,666

CLASS 546

17 4,477,667
72 4,477,668
85 4,477,669
141 4,477,670
291 4,477,671
294 4,477,672
344 4,477,673

CLASS 548

146 4,477,674
480 4,477,675
493 4,477,676
501 4,477,677

CLASS 549

62 4,477,678
486 4,477,679

CLASS 564

82 4,477,680

CLASS 568

336 4,477,681
362 4,477,682
379 4,477,683
4,477,684
462 4,477,685

CLASS 604

97 4,477,255
362 4,477,256

CLASSIFICATION OF DESIGNS

D2—	24	275,904			275,920		376	275,934	D14—	53	275,950	D19—	69	275,966	D23—	1	275,984
		275,905			275,921		448	275,935		60	275,951		75	275,967		29	275,985
		275,906		567	275,917	D10—	46.1	275,937		82	275,952			275,968			275,986
		275,907		569	275,915		106	275,936			275,953	D21—	13	275,971		115	275,988
		275,908	D7—	1	275,922	D11—	131	275,938		101	275,954		37	275,972		138 S	275,987
D3—	43	275,909		43	275,923	D12—	11	275,939		106	275,955		59	275,973	D24—	8	275,989
	48	275,910		301	275,924		88	275,940		114	275,956			275,974			275,990
	76	275,911		357	275,925		147	275,941	D15—	11	275,957		66	275,975			275,991
D6—	301	275,913		399	275,926			275,942		80	275,958		86	275,976		10	275,992
	357	275,914		407	275,927		174	275,943	D16—	26	275,959		107	275,977		47	275,993
	370	275,919	D8—	10	275,928		190	275,945		31	275,960		134	275,978	D25—	16	275,994
	388	275,912		14	275,929		192	275,944		112	275,961		191	275,979		89	275,995
	436	275,916		16	275,930	D13—	1	275,946	D17—	18	275,962		208	275,980			
	470	275,969		71	275,931		24	275,947		20	275,963		219	275,981			275,996
		275,970		83	275,932		25	275,948	D18—	8	275,964		233	275,982			275,998
	510	275,918	D9—	300	275,933			275,949		22	275,965	D22—	25	275,983		91	275,997

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6	:	4,477,819		4,476,976		4,477,727		4,477,326		4,476,902	4,476,811
01	:	4,476,993		4,476,982		4,477,757		4,477,393		4,477,014	4,476,850
		4,477,202		4,476,992		4,477,773		4,477,527		4,477,273	4,477,285
		4,477,769		4,476,999		4,477,811		4,477,537		4,477,298	4,477,345
04	:	4,476,621		4,477,003		4,477,812		4,477,607		4,477,422	4,477,408
		4,476,809		4,477,012		4,477,814		4,477,638		4,477,698	4,477,439
		4,477,074		4,477,015		4,477,816		4,477,669	17	: 4,476,646	4,477,529
		4,477,187		4,477,024		4,477,818		4,477,695		4,476,649	4,477,632
		4,477,430		4,477,037		4,477,822		4,477,701		4,476,667	4,477,647
		4,477,700		4,477,051		4,477,825		4,477,758		4,476,677	4,477,660
		4,477,873		4,477,054		4,477,847		4,477,876		4,476,686	4,477,717
06	:	4,476,592		4,477,069	10	: 4,476,631				4,476,698	4,477,754
		4,476,596		4,477,073		4,477,851		4,476,916		4,476,736	4,477,791
		4,476,632		4,477,079		4,477,853		4,476,921		4,476,775	4,477,864
		4,476,650		4,477,087		4,477,857		4,477,271		4,476,781	4,477,924
		4,476,654		4,477,098		4,477,872		4,477,321		4,476,826	19 : 4,476,589
		4,476,661		4,477,106		4,477,879		4,477,346		4,476,842	4,476,680
		4,476,673		4,477,129		4,477,885		4,477,457		4,476,847	4,476,849
		4,476,682		4,477,140		4,477,886		4,477,463		4,476,850	4,476,905
		4,476,684		4,477,156		4,477,890		4,477,474		4,476,872	4,477,030
		4,476,693		4,477,160		4,477,905		4,477,492		4,476,926	4,477,050
		4,476,703		4,477,190		4,477,908		4,477,526		4,476,973	4,477,084
		4,476,706		4,477,197		4,477,913		4,477,556		4,476,985	4,477,406
		4,476,707		4,477,211	08	4,476,609		4,477,617		4,477,019	4,477,504
		4,476,708		4,477,257		4,476,859		4,477,633		4,477,047	20 : 4,476,645
		4,476,713		4,477,266		4,476,954		4,477,671		4,477,062	4,476,663
		4,476,730		4,477,287		4,477,068		4,477,688		4,477,109	4,477,026
		4,476,732		4,477,322		4,477,070	12	: 4,476,685		4,477,135	4,477,228
		4,476,735		4,477,329		4,477,180		4,476,688		4,477,137	4,477,925
		4,476,762		4,477,336		4,477,232		4,476,810		4,477,158	21 : 4,476,771
		4,476,812		4,477,356		4,477,573		4,476,841		4,477,217	4,476,881
		4,476,814		4,477,373		4,477,755		4,476,845		4,477,247	4,476,946
		4,476,815		4,477,376		4,477,813		4,476,857		4,477,270	4,477,198
		4,476,817		4,477,403		4,477,920		4,476,883		4,477,307	4,477,335
		4,476,821		4,477,432				4,476,928		4,477,325	4,477,383
		4,476,866		4,477,459	09	4,476,617		4,476,956		4,477,340	22 : 4,476,924
		4,476,869		4,477,460		4,476,619		4,476,983		4,477,365	4,476,957
		4,476,871		4,477,462		4,476,648		4,477,056		4,477,413	4,477,412
		4,476,874		4,477,477		4,476,651		4,477,097		4,477,490	4,477,423
		4,476,877		4,477,482		4,476,734		4,477,207		4,477,506	4,477,657
		4,476,880		4,477,483		4,476,754		4,477,222		4,477,532	23 : 4,477,248
		4,476,894		4,477,508		4,476,756		4,477,250		4,477,541	4,477,354
		4,476,912		4,477,539		4,476,790		4,477,272		4,477,579	24 : 4,476,602
		4,476,930		4,477,542		4,476,837		4,477,289		4,477,605	4,476,660
		4,476,934		4,477,571		4,476,918		4,477,425		4,477,687	4,476,780
		4,476,936		4,477,577		4,477,042		4,477,471		4,477,693	4,476,799
		4,476,939		4,477,578		4,477,076		4,477,613		4,477,765	4,476,816
		4,476,942		4,477,598		4,477,086		4,477,716		4,477,801	4,476,839
		4,476,947		4,477,648		4,477,088		4,477,720		4,477,833	4,476,867
		4,476,955		4,477,672		4,477,089		4,477,783		4,477,888	4,477,141
		4,476,969		4,477,715		4,477,147		4,477,895	18	: 4,476,625	4,477,152
		4,476,972		4,477,718		4,477,231		4,477,919		4,476,655	4,477,297
		4,476,974		4,477,725		4,477,233	13	: 4,476,823		4,476,744	4,477,511

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26 : 4,476,588
4,476,599
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4,476,820
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